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KERRY ANN HARMER

A THESIS


SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN  
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF DESIGN

IN

INDUSTRIAL DESIGN  
DEPARTMENT OF ART AND DESIGN

EDMONTON, ALBERTA

SPRING 2006



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Managing Product Durability – Implications for Sustainable Design Methodology

Submitted by Kerry Ann Harmer in partial fulfillment of the requirements for the degree of Master of Design.







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Volume 100, Part 1, 1970

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**University of Alberta**

**Managing Product Durability - Implications for Sustainable  
Design Methodology**

by

**Kerry Ann Harmer**

A thesis submitted to the Faculty of Graduate Studies and Research  
in partial fulfillment of the requirements for the degree of

**Master of Design  
in  
Industrial Design**

Department of Art and Design

Edmonton, Alberta  
Fall, 2006







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## **Abstract**

Planned obsolescence is one of the major impediments to the sustainable design of consumer products. This thesis investigates a potential methodology for designing products for specific lifespans with the aim of managing planned obsolescence and shifting consumer behavior to a more sustainable consumption pattern. A rubric, developed from the principles of sustainable design in conjunction with research in the area of material culture, acted as a guideline for the early conception phase of the design process. The practical testing of this rubric is demonstrated through a case study framed within a scenario of Canadian IKEA consumers in which three domestic interior chairs are designed specifically for short, medium, and long-term use. Conclusions point to the importance of interdisciplinary and design researchers placing increased emphasis on 'product attachment' and detachment during the use phase of product lifecycles.

## **Keywords**

Sustainable Design  
Planned Obsolescence  
Material/ Consumer Culture  
Domestic Furnishings





## **Acknowledgments**

The work in this thesis would not have been possible without the kind assistance and support of a very important group of people. Firstly, I gratefully acknowledge the enthusiastic support of my supervisor Robert Lederer. His sustained encouragement, ideas and sound advice go far beyond this thesis. I thank Tim Antoniuk for generously sharing his sustainable design and industry expertise. I am thankful to Joan Greer for thoughtfully questioning my ideas and tenaciously reading my work. I gratefully acknowledge Rob Shields for his sociological insight. Many thanks to Ken Horne, Cam Frith and Ray McAdam for their technical skills and workshop support. I would also like to acknowledge the valuable input I received from Steve Bell, Cezary Gajewski, Rizwana Jiwa, Beverley Lemire and Arlene Oak. Most importantly, special appreciation goes to Brad Jones for his absolute confidence in me. To him, I dedicate this thesis.





## **Chapter 1**

### **1.1 Introduction**

Contemporary practices of design, production, and consumption in Canada and internationally create waste, environmental degradation, and social inequity. In a rapidly globalizing economy, the design of products in Canada has environmental, social, and political implications worldwide. This thesis will address the environmental and social imperatives related to the development of sustainable solutions in the design of household products. In particular this project will use design as an educational tool by engaging with behavior modification at the product-user interface, rather than at the marketing stage to manage planned obsolescence.

Chapter 1 of the thesis explains how planned obsolescence is one of the major impediments to the sustainable design of consumer products. Planned obsolescence is defined in three ways. First, the obsolescence of function is a design process that involves an existing product becoming outmoded as a new product is introduced to perform the function better. Second, the obsolescence of quality is a design process that plans for a product to break down or wear out at a given time. Finally, the obsolescence of desirability, the subject of this thesis, is a design process that involves the introduction of new styles or product changes that make the product seem obsolete in consumers' minds before the product physically loses its functionality.

The obsolescence of function can be managed by designing products to be upgradeable, thus prolonging their lifespans. The obsolescence of quality can be managed by designing products with durable materials that can be easily repaired. Studies discussed in Chapter 2.1 show that extending the lifetime of products results in savings in materials, energy and solid waste. However, efforts made to extend the functional lifetime of household products



will be meaningful only if consumers are motivated to keep their products longer through the management of obsolescence of desire. It is specifically this type of obsolescence and a potential methodology for managing it that is the focus of this investigation.

In an attempt to understand what encourages consumers to keep their products longer, the research in Chapter 2.2 applies sustainable design theory to the management of obsolescence of desire. Chapter 2.3 discusses sociological, psychological, and anthropological research in the areas of material culture, focusing particularly on possession theory. An examination of the social, psychological and interpersonal relationships that consumers develop with products during the use phase of the product lifecycle, especially pertaining to possession attachment, defines more closely what encourages or discourages 'product attachment' or detachment. This knowledge, I argue here, enables designers to develop products more appropriate for the anticipated use phase of a product lifecycle, in order to produce more psychologically durable products.

The ideal scenario involves designing durable products, which will encourage more sustainable consumption habits. However, it is not possible to deny the human need for short-term products in certain situations and life phases. Therefore, the practical applications of this theoretical research will be demonstrated through the design of three domestic interior chairs, specifically intended for short, medium and long-term use. The terms are identified by one persona as she moves through three phases in adult life; leaving home, setting up a first home, and starting a family. The persona is framed within the target market, of IKEA, the world's largest furniture retailer. The IKEA scenario and persona are outlined in Chapter 3. The methodology, explained in Chapter 3, demonstrates how designers must consider the importance of material and processing choices in sustainable design. Moreover, attention must be paid to user's social and psychological experiences with products in order to design





appropriately for the specified use phase of any product. However, for the purpose of this study the product category is limited to domestic interior arm chairs. Chapter 4 documents the development of the designs and how they adhere to the methodology and criteria outlined in Chapter 3. The process and methodology tested are discussed and evaluated in Chapter 5.

Conclusions drawn in Chapter 5 suggest that the research conducted will add to the current practices of sustainable design by focusing on 'product attachment' and detachment during the use phase, a topic which is often neglected in sustainable design practice and needs further attention from interdisciplinary design researchers.

## 1.2 Background

### 1.2.1 The History of Planned Obsolescence and the Evolution of Sustainable Design

This chapter will explore the evolution and problems associated with planned obsolescence as it was applied to consumer products during the twentieth century, initially in the United States and then spreading with strong implications to Canada and Europe. It will chart the changing cultural attitude toward the 'throw away' ethic of designed and mass produced waste. An explanation of why planned obsolescence exists today and how a sustainable design movement has evolved to tackle this complex issue will provide a background and situate the thesis research topic in an historical context.

Over the course of the twentieth century, planned obsolescence has become a consequential element in the production of goods. Planned obsolescence exists when products are designed to break down prematurely, the obsolescence of quality, are outmoded by advances in technology, the obsolescence of technology, or become out of fashion due to new, more fashionable styles being introduced, the obsolescence of desire. Imposed by CEOs





and designers, planned obsolescence has become culturally accepted by consumers and integrated into their behavior. In 1960, for example, Vance Packard provided a general outline of how planned obsolescence was viewed at that time, quoting a leading industrial designer as saying, “our whole economy is based on planned obsolescence... We make good products, we induce people to buy them, and the next year we deliberately introduce something that will make those products old fashioned, out of date, obsolete... It isn’t organized waste. It’s a sound contribution to the American economy.”<sup>1</sup> In general, industrial designers’ attitudes towards planned obsolescence have altered during the twentieth century. It was initially employed as a way to encourage economic growth in the 1930s, and now is a call to arms for a growing international sustainable design movement in the 2000’s.

The 1920s saw advances in mass production technology and the development of transportation and distribution networks which brought previously unknown goods to consumers. Design historian Susan McKellar notes that “products ranging from tinned fruit to automobiles became packaged and promoted nationally as never before.”<sup>2</sup> Following the Wall Street crash of 1929, America gave birth to the industrial design profession, which employed product styling and planned obsolescence. Many viewed the profession as an adjunct to advertising in the development of consumer culture as American’s were encouraged to buy their country out of the deepening depression.<sup>3</sup>

This concept of consumerism as a patriotic act was nowhere better demonstrated than in the automobile industry. Planned obsolescence was undoubtedly established in this young, burgeoning industry during the 1930s and 1940s. It was General Motors who led the drive to introduce planned obsolescence to the automobile industry. American historian, Roland

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<sup>1</sup> Packard, *The Waste Makers*, 46.

<sup>2</sup> McKellar, *Seals of Approval – Consumer Representation in 1930s America*, 2.

<sup>3</sup> Ibid., 1.



Marchand explains how “it adopted regular changes in both technology and style” and how Charles Kettering defined the General Motors Research Division’s mission as “the organized creation of dissatisfaction”. Marchand describes how Kettering had campaigned for the annual model and as early as 1927 “GM president Alfred Sloan had unreservedly adopted the principle of the yearly style change, which Jeffrey Meikle has called *artificial obsolescence*.”<sup>4</sup> However, at this time, not all industrial designers and manufacturers were blinded by the profits that planned obsolescence could generate. General Motors’s direct competitor, Ford eventually surrendered to the pressure of styling and the annual model change. Cultural historian Susan Strasser points out that “the triumph of obsolescence in the automobile industry has been told by a number of historians as part of the explanation for how Henry Ford – tenaciously and ideologically opposed to obsolescence, as a concept and in practice – forfeited his dominant share of the market.”<sup>5</sup>

During the 1930s and 1940s, Raymond Loewy, along with others such as Henry Dreyfuss, Walter Dorwin Teague and Norman Bel Geddes, was the most popular industrial designer of the day and probably the first of the superstar designers employed to make new products irresistible to consumers. During this time, the annual styling of form spread from the automobile industry into consumer product design. Loewy perfected styling as a means of increased profit with the then fashionable streamlined form, which reflected the fast paced technological developments and priority on speed. In 1950, he published the book *Never Leave Well Enough Alone*<sup>6</sup> which celebrated the success of Loewy’s industrial design practice illustrating numerous examples of products ‘before and after’ the styling process and proving how sales sky rocketed as a result.

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4 Marchand, *Advertising the American Dream*, 156.

5 Strasser, *Waste and Want : A Social History of Trash*, 193.

6 Loewy, *Never Leave Well Enough Alone*.





Thanks to Loewy and his fellow industrial designers, many needs of consumers had been met during the 1930s and 1940s resulting in a slow in the economy in the 1950s. Economists believed that something was needed to stimulate consumption and consequently the markets. The solution came when planned obsolescence moved from the exclusive domain of the automobile industry to that of consumer products in general, including home furnishings. It was not until this time of ever increasingly redesigned and restyled consumer products that the term 'planned obsolescence' became generally understood. In 1955 the phrase was first used in an article in *Business Week* which explained that "planned obsolescence is here to stay in the auto industry and it is moving into more and more fields".<sup>7</sup> This delighted the industrial design profession, which prided itself on the development of new and improved products to meet an ever growing consumer need for convenience.

Reyner Banham, one of the most influential writers on architecture, design, and popular culture from the mid-1950s to the late 1980s claimed in 1955 that, "we live in a throw away economy, a culture in which the most fundamental classification of our ideas and worldly possessions is in terms of their relative expendability". He went on to state that "it is clearly absurd to demand that objects designed for short useful life should exhibit qualities signifying eternal validity – such qualities as divine proportion, pure form or harmony of colours."<sup>8</sup> What Banham called for was an aesthetic of popular symbols that wears out as fast as the consumer goods of the time, essentially a "throw-away aesthetic".

Not only designers and historians such as Banham celebrated planned obsolescence; it had become a culturally accepted phenomenon. In 1957, George Nelson, probably one of America's most notable industrial and furniture designers, summed up the predominant notion of the obsolescence built into consumer products of the 1950s explaining that, "we believe in

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<sup>7</sup> Strasser, *Waste and Want : A Social History of Trash*, 274-275.

<sup>8</sup> Banham, *A Throw-away Aesthetic*, 63.



obsolescence. We support it the way we support the multi-party system, pasteurized milk, and a free press. We also talk quite a lot about planned obsolescence. At the same time, the implications of the word make us uneasy; they even provoke some people to equate obsolescence to commercial conspiracy and social degeneracy.”<sup>9</sup> It is important to note how Nelson acknowledged that the issue is not an easy one to address. He suggested that nature produces more seeds than are useful, but we do not deem this waste. He even questioned whether designers really have the ability to ‘plan’ obsolescence. Ultimately, he concluded his discussion of planned obsolescence affirming that, “to a designer, anything that is, is obsolete” and that as a process it is wealth-producing, not wasteful and that what “we need is more obsolescence, not less.”<sup>10</sup>

Nelson acknowledged that he was responding to the reactionary feeling of unease in Europe about the mass production and American consumer culture that was rapidly creeping into Canada and across the Atlantic Ocean. This inspection of consumer culture was articulated by American Vance Packard who wrote the *Hidden Persuaders* in 1956, a critique of the American advertising industry. In 1960, he wrote *The Waste Makers* another critique specifically targeting the industrial design profession. Packard questioned the practice of “progress through planned obsolescence”, especially citing the automobile industry as a major culprit.<sup>11</sup> After thirty years of carefully orchestrated consumption in North America and Europe, the general malaise of western culture in the 1960s came to a head. Design historian Penny Sparke notes that, “the international economy became increasingly unstable, the general sense of disillusion with materialism, and with the abuse of technology and other resources to political and economic ends, resulted in a wave of revisionist tendencies, many of them

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<sup>9</sup> Nelson, *The Problems of Design*, 43.

<sup>10</sup> *Ibid.*, 43-50.

<sup>11</sup> Packard, *The Waste Makers*, 45





involving design in one way or another.”<sup>12</sup> The publication of Rachel Carson’s *Silent Spring* in 1962 is generally understood to have triggered the first wave of environmentalism. This movement, concurrent with the hippie movement that called for ‘back to nature’ lifestyles, inspired designers to experiment with organic forms which were particularly prevalent in furniture.

Planned obsolescence was firmly part of the furniture industry in Europe and North America by the 1970s. Furniture manufacturer and retailer IKEA began publishing its catalogue in 1951 and by the 1970’s was publishing an annual catalogue, introducing new products each year.<sup>13</sup> Planned obsolescence was firmly rooted in all product categories by this time. The industrial design profession’s use of planned obsolescence came under even greater scrutiny in Victor Papanek’s seminal book *Design for the Real World*. Published in 1972, the same year as the OPEC oil crisis, it instigated a backlash from the profession which Papanek, a designer himself, had accused of nothing short of mass murder. He blamed them directly for “creating a whole new species of permanent garbage to clutter up the landscape” and stated that “by choosing materials and processes that pollute the air we breathe, designers have become a dangerous breed.”<sup>14</sup> Papanek called for the design profession instead, to “become an innovative, highly creative, cross disciplinary tool responsive to the true needs of men. It must be more research oriented, and we must stop defiling the earth itself with poorly designed objects and structures.”<sup>15</sup> Revolutionary designer, Buckminster Fuller echoed Papanek’s call in 1970 when he claimed that “making the world’s available resources serve one hundred percent of an exploding population can only be accomplished by a boldly accelerated design revolution

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<sup>12</sup> Sparke, *An Introduction to Design and Culture in the Twentieth Century*, 191.

<sup>13</sup> Torekull, *Leading by Design: The Ikea Story*, 116-117.

<sup>14</sup> Papanek, *Design For the Real World: Human Ecology and Social Change*, ix.

<sup>15</sup> Ibid., x.



to increase the present performance per unit of invested resources.”<sup>16</sup> Papanek emphasized the perils of planned obsolescence outlining the dangers in considering all consumer goods and human values to be disposable suggesting that “when we design and plan things to be discarded, we exercise insufficient care in design, in considering safety factors, or thinking about worker/user alienation from ephemeral trivia.”<sup>17</sup> The work of Buckminster Fuller and Papanek’s book were to become exemplary for a then fledgling environmental design movement.

Through the 1980s, the environmental design movement began to grow, as did the public’s awareness of environmental issues. The economic recession throughout the decade led consumers to question the durability of their products, even of their ‘durable products’ such as appliances and furniture. In the 1982, publication of *The Durability Factor – A guide to finding long-lasting cars, housing, clothing, appliances, tools and toys*, Yepsen asked “if durability has no opponents, then why is it in such short supply?... In dozens of polls, we Americans grumble that things don’t last as long as they used to.”<sup>18</sup> Thanks to consumer guides such as *The Durability Factor* and the publication of *The Green Consumer Guide*<sup>19</sup> in 1988, consumers could now exercise their power through making choices that were less harmful to the environment, their finances and in support of the phenomenon of ‘green design’. Public awareness was heightened by the Brundtland Report of 1987 from which the term ‘sustainability’, defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs,”<sup>20</sup> became the buzz

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<sup>16</sup> Pawley, *Buckminster Fuller*, 12.

<sup>17</sup> *Ibid.*, 87.

<sup>18</sup> Yepsen, *The Durability Factor*, 2.

<sup>19</sup> Elkington and Hailes, *The Green Consumer Guide*.

<sup>20</sup> Pauline Madge. “Design, Ecology, Technology: A Historical Review,” *Journal of Design History* 6, no. 3 (1993): 149.





word of the second wave of environmentalism and the rapidly growing 'sustainable design' movement.

In the 1990s, activists and environmentalists directly tied the design community's response to planned obsolescence to the ecological problems that were being increasingly disclosed by documents such as the Brundtland Report. In the book, *Eternally Yours*, Ed Van Hinte brought together international designers and expressed the feelings of designers that planned obsolescence needed to be addressed if culture was to avoid ecological tragedy. The Eternally Yours Foundation, a group of designers based in Europe, in the book asked a complex and multi dimensional question: "how do we increase the durability of products?"<sup>21</sup> One American voice in the book came from Michael McCoy, who was co-chairman of the Department of Design at Cranbrook Academy of Art, in Michigan, for twenty-four years. McCoy's contribution titled "Angling for Endurance" suggested that the kind of products that we cherish "often have a special character or quality of craft that sets them apart from less desirable objects... We have reached a point in technology where it may be necessary to return to traditional crafts and materials to satisfy users."<sup>22</sup> Concern with materials grew towards the end of the twentieth century as designers and consumers alike became more concerned with the ability to recycle certain materials in products.

Designers generally acknowledge that consumers have culturally integrated planned obsolescence into their lives. At the beginning of the twenty-first century, most consumers have not known a world where planned obsolescence did not exist. Architect William McDonough and chemist Michael Braungart question George Nelson's opinion regarding the creation of waste in nature, by pointing out that in nature "extra blossoms are far from useless.

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<sup>21</sup> Van Hinte, *Eternally Yours – Visions of Product Endurance* , 14.

<sup>22</sup> Ibid., 193-4.



They fall to the ground, decompose, feed various organisms, and enrich the soil.”<sup>23</sup> What McDonough and Braungart call for is a revision to the product life-cycle model of cradle-to-grave design and manufacturing, instead embracing a cradle-to-cradle approach. The cradle-to-cradle approach to design has been a very important development in sustainable design practice and will be investigated more closely in the following chapters. To explain the concept of cradle-to-cradle design the authors coined the term *waste equals food*, which means in a system where the materials are fully recyclable or biodegradable, the waste produced will contribute to the production of new materials and products. In essence, the authors believe that this approach, slowly becoming embraced by the design profession, means that obsolescence does not mean calculated waste, but a contribution to the future of the natural environment.

The dominant opinion of planned obsolescence altered greatly throughout the twentieth century. Planned obsolescence was implemented in the 1930s as a tool to fuel the economy. Once in place, obsolescence was championed by the design profession and consequently accepted by consumers. In conjunction with the rise of the environmental movement the sustainable design profession and consumers alike began to question planned obsolescence. The history of planned obsolescence and the evolution of sustainable design demonstrate that design is inextricably linked to consumer culture. This thesis aims to demonstrate one way that design can be a vehicle for change in consumption habits and the social and environmental impact of products.

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<sup>23</sup> McDonough and Braungart, *Cradle to Cradle*, 92.





### 1.2.2 The Problems Caused by Planned Obsolescence

The history of planned obsolescence demonstrates that following the Industrial Revolution and the onset of mass production, a throw-away economy emerged. The concept of planned obsolescence has been presented as one that was devised as a tool to encourage consumption. It follows that planned obsolescence has contributed to the over-consumption of natural resources in a highly unsustainable way. However, it is not possible within the scope of this thesis to detail the numerous problems associated with the over-consumption of natural resources and the subsequent pollution of our natural environment. Therefore, this section will only outline briefly the foremost issues resulting from over-consumption propelled by planned obsolescence: global inequity, environmental decline, waste generation, and physical and social decline.

Statistics illustrate the effects of planned obsolescence by a dramatic rise in consumption levels in the West throughout the twentieth century and into the beginning of the twenty-first. Consumption is rapidly growing in developing countries as well. The strengthening economies of China and India are allowing massive populations to join the consumer society with increasing household expenditures and extraction of raw materials. Each day in 2003, 11 thousand additional cars merged into traffic on Chinese roads. If China's accelerating vehicle ownership continues at its current rate, analysts expect more than 150 million cars to be jamming China's streets by 2015, some 18 million more than were driven on US streets in 1999.<sup>24</sup>

Rising consumption levels clearly demonstrate the extreme global disparity in consumer spending. The 12 percent of the world living in North America and Western Europe accounts

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<sup>24</sup> Halweil et al. *State of the World 2004*, 3-5.



for 60 percent of global private consumer spending, while the one-third of the world's population living in South Asia and sub-Saharan Africa accounts for only 3.2 percent of consumer spending.<sup>25</sup> This ever-increasing consumption is reflected in the greater use of raw materials; for example, between 1960 and 1995 the rise in the use of wood products increased 2.3 fold while synthetics, such as plastics rose 5.6 fold. Of that consumption of raw materials, the 5 percent of the world's population living in the United States alone is using about 25 percent of the world's fossil fuel resources.<sup>26</sup>

As the Developed world, predominantly Europe and North America, consumes natural resources at an increasing rate, the disposal of products at the end of their useful life is a growing problem. The amount of consumer waste is staggering. On average, an OECD (Organization for Economic Co-operation and Development) country generates five hundred and sixty kilos of municipal waste per year. Almost all of the twenty-seven countries were generating more per person in 2000 than in 1995. Meanwhile, Americans produce more than 51 percent more municipal waste per person than the average resident of any other OECD country.<sup>27</sup> The Living Planet Index, a tool developed by the World Wildlife Fund International to measure the Earth's natural systems shows a 35 percent decline in the planet's ecological health since 1970.<sup>28</sup> The Ecological Foot Print analysis devised by Wackernagel and Rees suggests that consumption levels had exceeded the earth's carrying capacity by the late 1970s or early 1980s.<sup>29</sup> The planet cannot bear the burden of everyone in the developing world owning as many material possessions as residents in North America, Europe and Japan. Research suggests that in order to accommodate the twin imperatives of environmental

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<sup>25</sup> Halweil et al. *State of the World 2004*, 5.

<sup>26</sup> *Ibid.*, 10-11.

<sup>27</sup> *Ibid.*, 16.

<sup>28</sup> See note 26 above.

<sup>29</sup> Wackernagel and Rees. *Our Ecological Footprint : reducing human impact on the earth*.



protection and social equity, the rich nations may need to cut their use of materials by as much as 90 percent over the next few decades.<sup>30</sup>

Until that time, landfill sites filled with obsolete products continue to generate methane and contribute to the accumulation of greenhouse gasses and rising global temperatures.<sup>31</sup> The ecological problems associated with the short lifespan and disposability of consumer products is one of the major concerns for world leaders. In 1995, the European Environment Agency defined the key environmental issues of the day as waste management, climate change, ozone depletion, air pollution and quality among others. Many products remain impossible to recycle, while some are very difficult to recycle such as polyvinyl chloride (PVC), the primary material many consumer products, including home exterior siding and interior furnishings. Victor Papanek noted in 1985 that “some countries have already restricted polyvinyl chloride since, unless it is burnt in special handling ovens, it releases dioxins and hydrochloric acids into the air,”<sup>32</sup> but still today PVC and many other problematic materials remain preferred materials in the furnishings and other manufacturing industries.

Halweil et al. in the *State of the World Report 2004* note that air quality concerns can be associated with increased health issues for consumers and workers alike. Physical and social health has declined and increased consumption has resulted in rising rates of obesity and related diseases. Furthermore, reduced social interaction and a reduction of social or civic involvement, defined as key to leading fulfilling lives by psychologists, has led to their general belief that, “the failure of additional wealth and consumption to help people have satisfying lives may be the most eloquent argument for re-evaluating our approach to consumption.”<sup>33</sup>

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30 Halweil et al. *State of the World 2004*, 97.

31 Fuad-Luke, *Eco Design – The Sourcebook*, 12.

32 Papanek, *Design For the Real World: Human Ecology and Social Change*, 37.

33 Halweil et al. *State of the World 2004*, 18.





Consumption is fueled by more than just planned obsolescence and is of concern for many reasons. In 2004, the World Watch Institute articulated this concern in their annual State of the World report. This report had a special focus, *The Consumer Society*.<sup>34</sup> In the Foreword, Borge Brend quotes the 'Plan of Implementation' that emerged from the World Summit on Sustainable Development in 2002 which states that, "fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development."<sup>35</sup> This emphasizes the importance of design and designers in achieving sustainability goals. Brend presents the example of the Rainforest Alliance who signed landmark accords with coffee and banana producers that enable consumers to purchase the eco labeled products of that project. This example proves that we have the capacity to "apply the cleaner production concept, to let consumers make informed choices, and to demand and provide environmental information...to eliminate harmful subsidies, and to create new markets. When we use these tools, we will change our patterns of consumption and production making them more sustainable."<sup>36</sup> Quite simply, if we do not, as president of the Worldwatch Institute states, "the single minded pursuit of consumption not only will undermine the quality of life of those in the consumer society, it will diminish the ability of those outside the consumption class to meet their basic needs."<sup>37</sup> Clearly, people must consume to survive. It is just a matter of how. This thesis aims to provide one way that designers can educate consumers about product durability to encourage social shifting from a highly consumptive society to one where consumption is reduced to more sustainable levels.

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<sup>34</sup> Halweil et al. *State of the World 2004*.

<sup>35</sup> *Ibid.*, xv.

<sup>36</sup> *Ibid.*, xvi.

<sup>37</sup> *Ibid.*, xviii-vix.



### 1.2.3 Research Conducted in the Field of Product Durability

There has been little research into planned obsolescence and the potential to manage it with the aim of increasing product durability and reducing environmental and social impacts and levels of consumption. Most research into material culture has focused on motivations behind the acquisition of goods rather than their long term possession and use. The available research is in the fields of economics and related disciplines such as economic psychology, economic anthropology, marketing, and consumer research. In these disciplines, we find only a small number of quantitative studies on product durability, while in the design field most research is of a qualitative nature.

In several studies (see Box and Cooper) researchers found that most of the products surveyed were still functional and in good condition when replaced, thereby demonstrating the importance of extending product lifespans.<sup>38</sup> As Tim Cooper of the Centre for Sustainable Consumption points out, “if sustainable consumption requires products to last longer, owners may need to develop greater attachment to their possessions and no longer aspire to update them as soon as new models appear on the market.”<sup>39</sup> He states that ‘product attachment’ cannot be effectively achieved if the lifespans of products continue to shorten due to current systems of production and promotion. The Centre for Sustainable Consumption in collaboration with the BRASS Centre at the University of Cardiff have initiated a Network on Product Lifespans and are presently conducting a research project into a product lifespan labeling scheme, the results of which are yet to be published.<sup>40</sup>

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38 See Box, “Extending product Lifetime: Prospects and Opportunities”, 34-49 and Cooper, “Slower Consumption: Reflections on Product Lifespans and the ‘Throwaway Society’”, 60.

39 Cooper, “Slower Consumption: Reflections on Product Lifespans and the ‘Throwaway Society’”, 53-62.

40 See the Product Lifespans Network website for upcoming publications: <http://extra.shu.ac.uk/productlife/projects.html> (accessed April 15, 2006).





Several studies have shown that for most products, the prime reasons for their replacement were product development and motivations of a non-technical nature, such as changes in models through innovations, styling, fashion, and lifestyle changes.<sup>41</sup> Box's study found this to be especially true for furniture where the socio-psychological reasons for product replacement, such as 'we got bored with it' and 'it did not fit the interior anymore', far outweighed other reasons for replacement, such as functional or technical reasons.<sup>42</sup>

In the field of design, what appears to be lacking is attention to the 'use' phase of the life cycle, especially from a social or psychological point of view. Joseph Fiskel acknowledged, in arguably one of the first guides to green design, "the longer the life of a product, the more eco-efficient it is, since the same amount of material delivers a larger amount of economic value."<sup>43</sup> Unfortunately, he does not outline strategies or methodologies for the design of more durable products.

The Eternally Yours Foundation attempted to address the issue of product durability and planned obsolescence. The foundation was founded in 1995 by a group of practicing designers and design theoreticians who believed that "It's time for a new generation of products that can age slowly and in a dignified way, become partners in life, and support our memories."<sup>44</sup> In 1997, the group published their book *Eternally Yours – Visions on Product Endurance*.<sup>45</sup> Verbeek and Kockelkoren quote the four possible approaches to sustainable design as defined in *Eternally Yours*: shifting products to services, ecological-design minimizing harmful materials and processes, recycling, and trying to elongate the lifespan of products.<sup>46</sup> The authors of the

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41 See Box, "Extending product Lifetime: Prospects and Opportunities", 34-49 and Cooper, "Inadequate Life? Evidence of Consumer Attitudes to Product Obsolescence", 425.

42 Box, "Extending product Lifetime: Prospects and Opportunities", 42.

43 Fiskel, *Design For Environment: Creating Eco-Efficient Products and Processes*, 105.

44 Verbeek and Kockelkoren, "The Things That matter", 29.

45 Van Hinte, *Eternally Yours – Visions on Product Endurance*.

46 Verbeek and Kockelkoren, "The Things That matter", 29.



book acknowledged that the psychological lifespan is the most important consideration and arrived at three areas to address in answering the question of how to prolong the psychological lifetime of products: 'Shape and Surface', which means that the forms and materials chosen can dictate the product's longevity, 'Sales and Service' which means that services connected with products can prolong their lifespan and allow consumers to build relationships with them, and 'Signs and Scripts' which means the investigation of how products function as symbols and icons for our lives.<sup>47</sup> These three main areas, among others, will be expanded upon in Chapter 2.2 and 2.3.

Researcher Jonathan Chapman builds upon the work of *Eternally Yours* in the recently published book *Emotionally Durable Design – Objects, Experiences and Empathy*.<sup>48</sup> The book addresses the complex issues surrounding product durability and premature disposal of products as a result of obsolescence of desire. The book is written in a text book fashion complete with summaries and a "Toolbox of Ideas" to aid designers in dealing with some of the complex issues that designing for durability raises.

Most recently, Nicole Van Nes completed a PhD Project in which she investigated design for product lifetimes by investigating consumer motivations behind product replacement and the exploring the possibilities of addressing these issues through product design. She developed a series of case studies within different product categories that would be durable from a quality, technology and desirability point of view.<sup>49</sup>

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<sup>47</sup>Verbeek and Kockelkoren, "The Things That matter", 29-30.

<sup>48</sup> Chapman, *Emotionally Durable Design*.

<sup>49</sup> Several publications from this research are currently in press. See her website for more information: <http://van-nes.com/> ( accessed April 19, 2006).



## Chapter 2

### 2.1 Applying the Principles of Sustainable Design to the Management of Obsolescence of Desire

The process of designing a product for sustainability requires an understanding of the principles of sustainable design practice. The principles of sustainable design, outlined in the following parts of this section, are an adaptation from those generally understood by researchers and practitioners of sustainable product design, particularly well articulated by Alistair Fuad-Luke in the “Manifesto for eco-pluralistic design... designs that tread lightly on the earth,” in his *Eco Design the Sourcebook* published in 2002 (see Appendix I).<sup>50</sup> In this section, the principles of sustainable design will be employed as a means to address possibilities for managing the planned obsolescence of desire in products. A general description of each principle will be followed by a suggestion as to whether the principle as a design methodology can have an impact on managing the obsolescence of desire. In Chapter 4, these principles will be revisited through a rubric which places emphasis on these principles in the design of three chairs intended for short, medium and long-term use.

The prime tool for assessing the environmental impact of a product is lifecycle analysis (LCA). Paul Burall, a writer and lecturer specializing in environmental, design, industrial and management issues, explains that “LCA is far from rough and ready: it aims to provide a statistical inventory of the total impacts made during the complete life of the product, from cradle to grave, from the acquisition of materials to final disposal.”<sup>51</sup> Lifecycle analysis is very complex. There are many types of statistical software that can be used to evaluate and

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<sup>50</sup> Fuad-Luke, *Eco Design Sourcebook*, 15

<sup>51</sup> Burall, *Product Development and the Environment*, 117.





compare the environmental sustainability of products; one example is SimaPro LCA software.<sup>52</sup>

Previously mentioned in Chapter 1, William McDonough and Michael Braungart in their visionary book *Cradle to Cradle* take the concept of lifecycle analysis one step further.<sup>53</sup> They frame the production process as one which is a completely closed loop cycle. This means that the disposal output of a manufactured product all returns into the production cycle of new products. LCA calculates inputs and outputs in the system of production, while the cradle-to-cradle approach requires that all outputs can return as inputs to the production of new products.

Each approach to product development has obvious benefits as evaluative tools in obsolescence management and the product-design process. However, because both approaches, LCA and cradle-to-cradle, focus on economic and environmental inputs and outputs, they lack the potential to evaluate the social and cultural impacts of products and do little to curb over-consumption. Such impacts are integral to holistically assessing sustainability issues and the management of obsolescence of desire.

The social and cultural impacts of products are very important to consider in the design process as humans in some way will interact with all designed objects, no matter what their function. Design as social commentary or as a means of demonstrating values and challenging the status quo maintained by existing products is one way in which designers can engage consumers. The object might stimulate a dialogue, send signs, or question the role of design itself. Housing and furnishings are some of the most expensive consumer products that people buy in their lifetimes. They are therefore an important expression of what a person values through conspicuous consumption. Straw bale architecture is a good example of how people

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52 SimaPro LCA Software. <http://www.pre.nl/simapro/default.htm>

53 McDonough and Braungart, *Cradle to Cradle*.



state their values through the choice of a home. Kathryn Henderson draws from her research and hands-on experience when she establishes who builds straw bale housing and why: “in most cases they are individuals, of any age, seeking either to build their own home or to build for others as an expression of conscientious values.”<sup>54</sup>

If humans communicate with and through objects by projecting and defining their identities, topics which will be explained in more depth in the following section 2.2, then designers create the vehicle for this interaction with designed objects. Consumers can communicate their values and beliefs through objects designed for sustainability. Furthermore, designers can question the status quo of products designed to be inherently obsolete. Designers have an important role in educating consumers through products by communicating their design philosophy and values through their products. Therefore, designers should create products that communicate the benefits of sustainability, aiming to educate consumers to make more informed consumption decisions.

If designers are to communicate through products and educate consumers, they must consider developing pleasurable user experiences. Design theorist Victor Margolin divides users’ experiences with products into *operative parameters* and *reflective parameters*. He argues that operative parameters are implied when we make use of a product. The reflective parameters refer to the evocative qualities or social significance of an experience with a product, the way we think about a product, give it meaning and derive pleasure. While the two dimensions of experience are different, they work together as we always consider what a product means to us when we use it.<sup>55</sup> Identifying the operative parameters of an experience is easier than doing so for the reflective parameters. Because the operative parameters are limited to the configuration of the product, most people will have the same experience of that

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<sup>54</sup> Henderson, “Straw Bale Building: Using Old Technology to Preserve the Environment”, 190-202.

<sup>55</sup> Margolin, “The Experience of Products”, 57.





product; for example, a pen enables one to write. However, there is no limit to the reflective parameters of a product, its evocative qualities or social significance that can make a product desirable. If products begin their useful lives as highly desirable, then the obsolescence of desire is less likely to take hold, especially if over time the evocative qualities and social significance are allowed to flourish.

The evocative qualities or social significance of a product will not be equally important to all individuals. They will depend on how an individual interacts with it and how it resonates with his or her own sensibilities, past experiences, age, gender, ethnicity and culture. The evocative qualities of an experience will conjure up personal memories, emotions, or previous experiences, as well as reinforce the sense of self. Designers create the vehicle for this interaction with objects and so hold an important role in creating and nurturing pleasurable experiences through user and product interactions.

Psychologist Csikszentmihalyi has defined areas of these reflective parameters of product experience. He says that when people reflect on how it feels when their experience is positive, they mention at least one and often all of the following: that the experience was a challenging activity requiring skills to complete a task; that the merging of action and awareness occurred (i.e. they had to concentrate); that they had clear goals which were met and from which they received feedback; that they lost the notion of time when they concentrated on the experience; that they felt that they were exercising control during the experience; that they lost the feeling of self consciousness; and, that time was transformed and did not pass the way it normally does.<sup>56</sup> According to this analysis, to design a product that offers a rich and compelling experience that allows personal meanings to be attributed to it, designers must allow for a variety of personal reflective experiences to occur so that users can

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<sup>56</sup> Csikszentmihalyi, *Flow – The Psychology of Optimal Experience*, 49-67.



assign their own personal meanings, thus encouraging them to retain the product longer, minimizing premature obsolescence of desire.

Through minimizing premature obsolescence of desire designers can increase the value of a product by designing to maximize a product's benefits to communities by building social capital. First, we must understand what social capital is. Professor Carmen Sirianni, editor-in-chief, and Dr. Lewis Friedland, research director, of the Civic Practices Network a collaborative and nonpartisan research and learning project bringing together a diverse array of organizations and perspectives within the civic renewal movement, define social capital as those stocks of social trust, norms and networks that people can draw upon to solve common problems. They explain that networks of civic engagement, such as neighborhood associations, sports clubs, and cooperatives, are essential forms of social capital. The denser these networks are, the more likely that members of a community will cooperate for mutual benefit. Therefore, they say that social capital tends to accumulate when it is used, and be depleted when it is not.<sup>57</sup> Examples of social capital are car sharing or pooling schemes such as ComunAuto in Montreal or bicycle sharing in many cities across North America and Europe. Design can be employed to create community facilities where the sharing of products is encouraged. In sharing products, the obsolescence of desire would not be an issue because when one person no longer desires the product, despite it still having a functional lifespan, another person may desire and make use of the product, thereby prolonging its use phase lifespan.

Building upon the idea of social capital is the idea of dematerializing products into services, through renting and sharing. Designer, educator, and author, Ezio Manzini defines the beginning of the industrial era as a time when the development of product-based well-

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<sup>57</sup> Sirianni and Friedland "Civic Dictionary – Social Capital," *Civic Practices Network*. <http://www.cpn.org/tools/dictionary/capital.html> (accessed February 24, 2006).



being first occurred. This period was characterized by the processes of materializing services into products (for example, laundry service into washing machines) and democratizing access to them by producing them in increasing quantities at decreasing prices (for example, mass production of goods). Manzini notes that it has become evident that this 'product based well being' is utterly unsustainable<sup>58</sup>. He suggests a return to a more service-based economy that promotes social capital as an affective solution. When products, especially those that are not used on a regular basis, are dematerialized into services or the renting and sharing of products is promoted, the result is a prolonged useful life of products and encouraged durability as with the nurturing of social capital.

One way to make shared products more successful, to build social capital and, to create more pleasurable experiences with products is to design flexible and customizable products that can be interpreted and configured by the user. Designers cannot make meanings for people because different users attribute different meanings to products to varying degrees. Furthermore, consumers are no longer members of an amorphous homogenous market as they were in the nineteenth century and the beginning of the twentieth century. Pine asserts that instead, American society, for example, is more diverse concerning class, race, gender, lifestyles, and national origin and overall is growing older. This is even more evident in a multi-cultural and bi-lingual society such as Canada. Moreover, income distribution is not as equal as it was a century ago. This has created differences in disposable income with corresponding disparities in needs and desires. Pine asserts that society is composed of a diversity of real people with real problems to be solved, with each individual having different interpretive experiences and values; therefore, each solution must be different as well.<sup>59</sup> Design theorist Richard Buchanan suggests that if all users are not the same, then the role of the designer is

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<sup>58</sup> Manzini, "Context-based wellbeing and the concept of regenerative solution," 141.

<sup>59</sup> Pine, *Mass Customization*, xiv-30.





to design for the individual in his or her context, not for a universal audience, national group, market segment or vague group called 'consumers'. He argues, "our products should support the individual in the effort to become an active participant in culture, searching for locally significant coherence and connection. Products should be personal pathways in the otherwise confusing ecology of culture."<sup>60</sup>

A unique product will not only fully satisfy the operative parameters of the user and product experience more successfully but also will allow for more personalized reflective parameters. A positive operative experience of a product, in conjunction with evocative experiences and greater social significance, will impart deeper psychological meaning to such products than those that are mass-produced and homogenous. This will encourage increased desire for the product rather than premature obsolescence.

Customization by flexible design or personalization can lead to greater customer satisfaction and a more durable psychological relationship with the product, which is one way to manage the premature obsolescence of desire. Designs for a heterogeneous niche market that demands higher quality goods that more closely match individual desires require flexibility in manufacturing processes and maintenance are enabled by Design for Disassembly (DFD). DFD is a design methodology employed to ensure that at the end of a product's life, all component parts can be separated and reused or recycled. Some of the areas associated with DFD are defined as: Design for Ease of Disassembly to ensure the easy removal of components, Designing for Ease of Reassembly for reconditioning and reprocessing of parts, both of which prolong the lifespan of products and attempt to manage premature obsolescence of quality and technology.<sup>61</sup> Furthermore, through designing for ease of reconditioning,

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<sup>60</sup> Buchanan. "Branzi's Dilemma: Design in Contemporary Culture", 27.

<sup>61</sup> T. Dowie-Bhamra, "Design for Disassembly", *The Interdisciplinary Journal of Design and Contextual Studies*, <http://www.co-design.co.uk/design.htm> (accessed August 31st, 2005).



reassembly and reprocessing of parts, the user can also change the aesthetic and customize the product. Designer Renny Remakers says that, “products become more familiar still when the user is able to inject something of himself into them, modify them in a personal way.”<sup>62</sup>

The DFD principles of reconditioning, refurbishment, re-manufacture, repair and service all extend a product's quality and technical life through offering potential for increased longevity and greater intrinsic product durability. Also note-worthy is how the product longevity provided by DFD can allow for relationship building through user participation with products. The customization of products, enabled through DFD, by designers and consumers creates a more unique and satisfying experience with a product promoting ‘product attachment’ and the management of obsolescence of desire.

Recent developments in DFD and limited run production technology can allow designers to use mass production techniques to create high quality, customized products. However, it can be said that customized products require the localization of marketing, design and manufacturing. This will enable companies to become more sensitive to local demands impacting upon the present monoculture of products. For example, through localization marketing and promotion can be more culturally sensitive and therefore more effective. Design can also be more culturally sensitive, appealing more to the taste and needs of a local demographic, producing a more meaningful material culture that will inherently be more durable and maintainable, thereby reducing the planned obsolescence of desire.

Limited production and localization has long been associated with art and craft. Historian Linda Sandino suggests that there has been a movement to return to the crafts because “transience is embedded in our encounters with both the fleeting art installations and the throw-away manufactured product, while permanence has been a self-conscious avowed

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62 Remakers, *Droog Design in Context: Less is More*, 59.





characteristic of the crafts. Using precious materials or skills, the art or craft object offered itself as a counterpoint to the mass-manufactured industrial product.”<sup>63</sup> The processes used in the manufacture of a product will directly affect the aesthetic result that in our culture is highly desirable because, as Papanek points out, people think that products that are not mass-produced have been hand crafted more carefully with love. He says “this may also explain the rising appreciation for the crafts over the last few decades – not only as an escape from machine precision, but also from a desire to own an article that literally bears the stamp of its maker – a visual clue to the intent of the craftsman and to handmade quality.”<sup>64</sup>

In *The Persistence of Craft*, Gareth Williams writes in his essay “Creating Lasting Values” that, “in order to maintain relevance in the modern world, craft must engage with contemporary concerns.”<sup>65</sup> He adds that the crafts are engaged politically with environmental issues and have striven to become more relevant in modern society. He suggests that crafts are exempt from charges of pollution or over-consumption because art and craft by their nature involves limited production and one-off objects. Crafts are often made by hand or low technology, but share a common historical root with the industrial production of commodities and therefore can contribute to the “green debate” in many ways.<sup>66</sup> Craft products are often simply manufactured from unusual, but often readily available materials or created by hand, using rare materials. The resulting unique aesthetic appeals directly to the individual can minimize the obsolescence of desire.

Art and crafts often involve locally available materials which include recycled and ready-made objects. The consideration of recycling materials is important at the beginning and at the end of a product’s lifecycle. Designer Constantine Boym calls this recycling of materials, as

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63 Sandino, “Here Today, Gone Tomorrow – Transient Materiality in Contemporary Cultural Artifacts,” 283.

64 Papanek, *The Green Imperative: Ecology and Ethics in Design And Architecture*, 15.

65 Williams, “Creating Lasting Values”, 61.

66 See note 60 above.



applied to his series of ceramic compositions, 'Salvation Objects'. Recycling minimizes the use of raw materials and prolongs the useful life of the materials already in the product stream. By reducing materials in the production of the design, minimal impact on the environment is achieved. Recycling can add inherent meaning to new products. For example when family jewels or precious metals are recycled into new jewelry, the value and attachment to the materials continues in the new jewelry while new meaning can be added through the personalization of the product increasing its emotional value.

This participation in the act of crafting the object itself allows the user to develop an experiential, emotional bond with the product that will give the product a new meaning for the user. Furthermore, the obsolescence of desire is reduced when the user interacts with the object by repairing it themselves. Designers acknowledge that "repairs should be straightforward so as not to be a contributing factor in premature obsolescence and unnecessary disposal."<sup>67</sup> Humans want new things, but familiar things are also important to our lives. As Renny Remakers says "a logical solution would be to combine the familiar applied in a novel way...Products become more familiar still when the user is able to inject something of himself into them, modify them in a personal way."<sup>68</sup> An example that Remakers uses to support his idea is Tejo Remy's rag chair that is made from a bundle of clothes tied together with straps. The chair could be composed of clothes discarded by its user, incorporating part of the user's personality. Through repairs the user or new users, in second hand markets, can change the aesthetic of a product, upgrading the desirability of the product.

In summary, the principles and practices of sustainable design can act as inspiration for designers to begin to re-think their role in the current practice of obsolescence inducing mass production, instead creating desirable, meaningful and lasting products.

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<sup>67</sup> Cavanaugh-Downs et al. *Design + Environment: A guide to designing greener goods*, 8.

<sup>68</sup> Remakers. *Dröog Design in Context: Less is More*, 59.



## 2.2 Applying Possession Theory to the Management of Planned Obsolescence of Desire

The material world that has been created is more important now than at any other time in history. This is because our current production and consumption activities have created a strong threat to sustainability, necessitating a re-evaluation of our relationship to the possession of material goods. The main reason for designers' need to understand consumption in relation to sustainable design and planned obsolescence of desire is not to understand how needs and wants can be satisfied, or how to encourage consumers to purchase greater or fewer products; designers, marketers and economists have these areas of thought well researched. What designers need to understand is how objects are experienced, what needs other than functional ones are met, and what social and psychological structures are supported by or contradict those needs. Ultimately, what is of particular interest is the process by which people relate to products and the systems of human behavior and relationships that can result from interactions with meaningful products. A greater understanding of what it is that people seek in their material culture will result in the design of a meaningful material culture that allows for 'product attachment' and endurance.

What people seek in their material culture and the reasoning behind material possession can be broken down into three areas of study: the biological, which suggests that we have a genetic acquisitive instinct; the individual-centered, which looks at the functions that possessions fulfill for individuals on a psychological level; and, the social constructivist, which focuses on possessions as material symbols of our identity from a sociological viewpoint.<sup>69</sup> In this section, I will provide a brief overview of these reasons for material possession.

At the root of material possession theories is sociobiology, which suggests that the 'acquisitive instinct' is a natural tendency for humans to acquire and hoard material

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<sup>69</sup> Dittmar, *The Social Psychology of Material Possessions*





possessions. This instinct may have residual routes in biological survival behavior found in most animals; that is, the search for food and shelter. Social psychologist Helga Dittmar notes that the biological theory of material possession has been contested by researchers in attempt to explain gift giving which might seem to contradict the idea of possession for survival only. Dittmar notes that this has been explained as a principle of kin selection for maintaining the gene pool, while gifting outside of the family has been viewed as reciprocal altruism, which again enforces the likelihood of survival of the fittest.<sup>70</sup>

Unlike the socio-biological, the individual-centered approach is the most investigated by psychologists and is comprised of three areas of work. The first area involves the role of material objects in self-description and self-perception. The second area involves the implication of possessions for self-esteem and a feeling of well being. The final area involves research into property crimes or loss of possessions and the impact on owners' sense of self.<sup>71</sup> Dittmar outlines several studies undertaken in the 1970s which concurred that possessions were often named as elements of the self only after body parts and actions. Studies by Csikszentmihalyi have suggested that we need things for a psychological, not a physical dependence. Most things we make serve to stabilize the order of the mind by acting as markers of our very existence and do not make life better in any material sense.<sup>72</sup> Furby's often cited studies in the 1970s, on possession behavior also found two central characteristics, that the meaning of, and the motivation for, possession were closely linked to "effectance motivation and the experience of personal self control" and "the self-concept".<sup>73</sup> Dittmar reviews several studies to find that material possessions are employed as a source of self-esteem through the use of objects to bolster low self-esteem. People also tend to use

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<sup>70</sup> Dittmar, *The Social Psychology of Material Possessions*, 19-39.

<sup>71</sup> Ibid., 44.

<sup>72</sup> See note 67 above.

<sup>73</sup> Furby, "Understanding the Psychology of Possession and Ownership", 459.



possessions to self-enhance, particularly to counteract the negative feelings of failure. This idea is linked to the social expectations of comparative self-esteem evaluations,<sup>74</sup> which will be expanded upon later in this section in the discussion of social constructivist theories. Dittmar purports, that if material possessions are constitutive parts of the self-defined through self-perception and self-esteem, then the loss of these possessions will be experienced as a lessening of the self. She cites several studies documenting this theory which refer to the unintentional loss of personal possessions through natural disaster and theft. This tends to result in "the acute discomfort and anxiety of victims described in the literature as one of losing part of them when possessions are stolen or destroyed against their will."<sup>75</sup>

Dittmar notes that throughout history, who we are has been defined increasingly through what we have as individuals. However, in the west, our identity used to be ascribed based on our inherited position in society. With the onset of the Industrial Revolution, identity was no longer fixed and social group based, but could be achieved through the individual acquisition of material possessions and wealth. This shift from the ascribed identity to an achieved identity can be linked to the rise of mass consumer society.<sup>76</sup> In particular, work in anthropology suggests that "material objects also constitute an intricate system of symbols which reflects the entire social fabric of our culture."<sup>77</sup> Dittmar uses Douglas and Isherwood's research to suggest that, "people use material goods and consumption patterns as a fundamental way of understanding, orienting themselves in, and interacting with their social environment."<sup>78</sup> She suggests that this is because material artifacts, including possessions, are providing individuals with an understandable symbolic world, which exactly mirrors and

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<sup>74</sup> Dittmar, *The Social Psychology of Material Possessions*, 44-45.

<sup>75</sup> Ibid., 46-47.

<sup>76</sup> Ibid., 12-13.

<sup>77</sup> Ibid., 6.

<sup>78</sup> Ibid., 8.





communicates interpersonal dynamics and social realities. Dittmar further notes that an understanding of what material possessions mean has to take into account shared beliefs and values within the “fundamental triadic unit of self, other and material object.”<sup>79</sup>

It seems then, that we consume material goods in order to satisfy biological needs, define ourselves as individuals and as part of a society. These acts of consumption are fundamentally a quantifiable, material activity involving physical units of raw materials processed into products. However, sociologists Chen and Murphy explain that consumption in the form of the acquisition of goods is “undeniably tightly bound up with the cultural practices aimed at achieving numerous social objectives including the production or reproduction of values, a cohesive society and individual identity”.<sup>80</sup> In his 1968 book *The System of Objects*, Jean Baudrillard attempted to define consumption suggesting that consumption was not a passive absorption or an appropriation, but an active form of relationship with not only objects, but also with society and the world. He wrote: “Consumption is the virtual totality of all objects and messages ready-constituted as a more or less coherent discourse. If it has any meaning at all, consumption means an activity consisting of the systematic manipulation of signs.”<sup>81</sup>

Baudrillard suggested that traditional symbolic objects such as furniture act as the mediators of a real relationship and that they are not consumed until the object first becomes a sign. Objects derive their meaning only from an abstract and systematic relationship with other sign objects. It is only in this context that they can be ‘personalized’ to be consumed, not in their materiality but in difference, the ‘projection’ of their inter-relationship with other sign objects.<sup>82</sup>

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<sup>79</sup> Dittmar, *The Social Psychology of Material Possessions*, 7.

<sup>80</sup> Chen and Murphy ed. *Exploring Sustainable Consumption: Environmental Policy and the Social Sciences*, 5.

<sup>81</sup> Baudrillard, *The System of Objects*, 200.

<sup>82</sup> Ibid., 200-205.



The act of consuming objects to find signs within our lives explains why we consume. Arthur Berger notes in *Shop 'til you Drop*, that anthropologist Mary Douglas defined four main consumer cultures: fatalists; elitists; individualist; and, egalitarians. He points out that people may not be able to articulate their beliefs and values, but can recognize that those values and beliefs are not those of other consumer cultures. He says that what this means is that consumption is primarily based on individual wants or desires.<sup>83</sup> Berger breaks down the act of consumption into a list of types or modes of consumption: to buy is to be perceived; sales mean that we can spend at the same time as save; we are giving ourselves the rewards that we deserve; consumption is a way of showing our creativity; conspicuous consumption is used as a sign of success; consumption is used as a dramatic narrative; we are caught in a chain of consumption; and, we imitate the desire of others through mimetic desire.

For this study, I am examining what it is that makes us attached to products, prematurely discard, or deem them obsolete once we have made purchases and brought things home. Using Veblen's *Theory of the Leisure Class*, in particular his theory of 'conspicuous consumption', sociologist Michael Mayerfeld Bell suggests that we dispose of products because using excessive amounts of goods or discarding of something rather than re-using or repairing as an act of 'conspicuous waste'. He says that this projects to society the consumer's elevation above material concerns that satisfy physical needs. This enables the consumer to demonstrate their rise to the higher needs defined by Maslow's Hierarchy such as emotional aesthetic and self fulfilling needs. Bell also points out that in order to be socially significant, conspicuous consumption must be more than the social norm, meaning that the environmental impacts of conspicuous consumption, leisure and waste also continually rise.<sup>84</sup>

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<sup>83</sup> Berger, *Shop 'til You Drop*, 11.

<sup>84</sup> Bell, *An Invitation to Environmental Sociology*, 36-37.



Research has established that objects act as fundamental indicators or symbols of individual identity that communicate a person's social location and individual qualities. This might partly explain people's attachment to their personal possessions.<sup>85</sup> Moreover, meaning in products is borne of experience. As Savas suggests "along with their interests, past experiences, future goals, values, ideas, culture etc. people may respond to different aspects of a product and live different experiences with that product, therefore, give it a meaning in different ways."<sup>86</sup> Experiences create emotions towards products that are invoked by symbolic meanings and thereby may induce 'product attachment' or detachment.<sup>87</sup> Savas defines attachment to a product as a positive emotional relationship between person and product indicating a strong linkage between them. Jonathan Chapman in *Emotionally Durable Design* draws parallels between interpersonal relationship successes and failures and person with product relationship successes and failures.<sup>88</sup> The relationship between the person and product results in the person considering the product a part of the self and therefore indicating a strong will to keep that product. On the other side, a lack of concern for a product and a concurrent willingness to discard it is defined by a negative emotional state of the relationship between person and product.<sup>89</sup> Savas's study of the nature of detachment found that, as with attachment, specific products constitute the nature of detachment, rather than the utility offered by that product.<sup>90</sup> Furby also notes that the meaning of, motivation for and implications of possession are dependant on what something is.<sup>91</sup> 'Product attachment' and detachment

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85 Dittmar, *The Social Psychology of Material Possessions*, 9.

86 Savas, "A Perspective on the person-product relationship: attachment and detachment", 317.

87 Ibid., 317.

88 Chapman, *Emotionally Durable Design*, 18-21.

89 Ibid., 318.

90 See note 80 above.

91 Furby, "Understanding the Psychology of Possession and Ownership", 458.





reasons will be explored further in the following section, broken down into the following four categories: time; product category; emotions; and motivations.

Relationships with products are built over time. Savas found that the average time of ownership of products with which their user was attached, is 19.8 years.<sup>92</sup> Schifferstein et al. concluded that 'product attachment' grows over time, especially after 20 years of ownership, but that a rating for products owned for 1-20 years was marginally higher than new products. Moreover, Individuals tend to take care of products they are attached to which further develops the relationship.<sup>93</sup>

Meaningful relationships with products can lead to 'product attachment'. Battarbee and Mattelmaki's study of meaningful product relationships, from a design point of view, found that product relationships fall into three product categories: meaningful tool, 'meaningful association' and 'living object'.<sup>94</sup> A meaningful tool is needed for a purpose in which it is the activity that is of meaning to the person. The tool can act as a facilitator that satisfies multiple human needs, such as: safety, mobility, accomplishing things, meeting challenges, earning money, and mastering skills. Alternately, the meaningful tool can act as self expression, using the objects for purposes of creativity, productivity and self representation. In a meaningful association relationship, products are meaningful because they refer to or carry meanings that are cultural or personal. A meaningful association with a product can convey a personal, cultural or professional identity as well as an aesthetic style or taste. This association with a product can also link to a memory, person, emotion or story. A living object is an emotional bond that is created between a person and product whereby the product has been a companion for so long that it seems to have its own personality, soul or character often

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92 Savas, "A Perspective on the person-product relationship: attachment and detachment", 319.

93 Schifferstein. et al. "Designing Consumer-product attachment", 328.

94 Battarbee and Mattelmaki. " Meaningful Product Relationships", 338.



distinguished by marks of use.<sup>95</sup> More specifically, Savas's study of the nature of attachment found that certain products play a more significant role in the nature of attachment rather than the product's utility and experience.<sup>96</sup> Schifferstein et al.'s survey supports this claim as they found that attachment scores were higher for ornament than for the three other product categories assessed in their study: lamp, clock and car.<sup>97</sup>

Savas found that the kind of positive emotional responses toward attachment products were the following: confidence, independence, care, relaxation, passion, achievement, nostalgia, warmth, security, love, pleasure, satisfaction, pride, charisma, attractiveness, friendship, and comfort.<sup>98</sup> These positive emotional characteristics support the individual and social reasons for consumption discussed earlier.

When recalling the purchase of 'attachment products' (products to which people are attached) respondents in Savas's study noted that positive emotions were supported by pleasant memories. The study revealed motivations behind 'product attachment' to be explained as follows: nostalgia or family heirloom status; enjoyment experiences of products that involved frequent actions or invoke desired feelings; utilitarian and high level of performance; re-enforcement of personal being or sense of self; social status or image and community through linking with others, and the aesthetic appeal of the form of the object.<sup>99</sup> This concept is corroborated by Csikszentmihalyi and Rochberg-Halton's research. One respondent in their study describes a cherished sculpture saying, "I am going to keep this thing

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<sup>95</sup> See note 87 above.

<sup>95</sup> Battarbee and Mattelmaki. "Meaningful Product Relationships", 340.

<sup>96</sup> Ibid., 318.

<sup>97</sup> Schifferstein. et al. "Designing Consumer-product attachment", 328.

<sup>98</sup> Savas, "A Perspective on the person-product relationship: attachment and detachment", 318.

<sup>99</sup> Ibid., 318-20.



forever. I wasn't even in school and me and my mother went to the store and I told her this looked like her, so she bought it. I'm going to keep this for life. It reminds me of my mother."<sup>100</sup>

Schifferstein et al. found that the determinants of attachment broke down by the four product categories assessed. Memories were only significant for lamps, clocks and ornaments, while enjoyment was only significant for cars. The utility of attachment products was not a driving factor in retention as people kept things with which they were attached even if the product no longer functioned properly; this was especially evident in the case of clocks. Schifferstein et al. concluded by suggesting that memories are found to be the primary reason for attachment to old things, while enjoyment is the primary reason for attachment to new things. They suggest that "if a designer wants people to become attached to his or her product... s/he should facilitate ways to form associations between the product and people, places or events (memories), or s/he should design a product that evokes enjoyment."<sup>101</sup> Furthermore, Savas notes that once 'product attachment' is achieved; it is not much affected by ageing or changes in the market.<sup>102</sup> This means that the psychological lifespan of a product can be positively affected, which thus has considerable implications for curbing excessive consumption activities, due to a slowing in replacement and the obsolescence of desire.

Conversely, excessive consumption will result from 'product detachment' and premature product replacement. People tend not to care for products they are not attached to and thereby will easily discard, give away, sell or forget about such products. Savas found that these products were only used one or two times and were retained on average for 4.4 years.<sup>103</sup>

The feelings described by the study subjects towards 'detachment products' were; dislike, regret, discomfort, disturbance, dissatisfaction, boredom, bad image, distrust,

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<sup>100</sup> Csikszentmihalyi and Rochberg-Halton, *The Meaning of Things*, 229.

<sup>101</sup> Schifferstein. et al. "Designing Consumer-product attachment", 331.

<sup>102</sup> Savas, "A Perspective on the person-product relationship: attachment and detachment", 321.

<sup>103</sup> Ibid., 319.





disappointment, failure, stress, and wasted money. Often the memory of a detachment product purchase is of regret, unconscious purchase, superfluous purchase, attractiveness, advertisements, love at first sight or friends' convincing. If a person feels indifferent to a product then they are more likely to discard it when it fails to function properly or becomes technologically or fashionably aged.

Savas defined motivations for detachment from products as follows: uselessness in terms of performance, excessive cost of maintenance, lack of relevance to the definition of self, boring, representation of belonging to an undesirable social class, projecting the 'wrong' image, undesirable aesthetics, purchase was superfluous, disappointment of expectancies in use, and finally changes in living conditions affecting the need for the product.<sup>104</sup> Dittmar notes that although only supported by anecdotal evidence, people rid themselves of possessions if they feel they are no longer compatible with their sense of self, that is, "it's just not me any more!"<sup>105</sup>

The social, psychological and anthropological reasons and motivations for our material culture are complex. This section has touched upon why we need things, what consumption is and what our consumer products mean to us. Chapter 3 will bring together the sustainable design and the social psychological approaches to discuss a methodology that demonstrates the importance of understanding both areas of study to design appropriately for the use phase lifespan of products.

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<sup>104</sup> Savas, "A Perspective on the person-product relationship: attachment and detachment", 318-20.

<sup>105</sup> Dittmar, *The Social Psychology of Material Possessions*, 47.



#### **3.1**            **Product Category – Chairs, and the IKEA Scenario**

Chairs have a history as the heroes among furniture. Several works have this history well documented.<sup>106</sup> Chairs have allowed people to demonstrate their social position, through physical artifacts and semantics. “At the functional level, a chair makes physical and psychological connections with the individual sitting in it through its form and use of materials. At the same time, it may embody meanings and values which connect with the user at an intellectual, emotional and aesthetic, cultural and even spiritual level.”<sup>107</sup> Meanwhile, chairs serve to challenge designers who must design chairs to support people of varying shapes and sizes for varying tasks and lengths of time sitting. It is for these reasons that there is no ideal form and in conjunction with sustainability goals, chair design continues to pose a challenge.

Using the IKEA Company as a framework for a case study of the design of three domestic interior chairs provides a context in which a ‘persona’ can be developed within proposed scenarios of consumption behavior patterns. Personas, when used in the design process, represent the desired user or consumer, enabling the designer to create scenarios of behavior that can inform the design of a product. As IKEA is the largest furniture retailer in the world, it is a logical choice to use their target market. By framing the products within one company, the persona developed can be more focused. This section will provide a brief overview of IKEA, its company philosophy and sustainability record, in order to be able to imagine the scenarios proposed for the design, production, sales and, marketing of the chairs.

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<sup>106</sup> See, Cane, *300 Years of American Seating* and Morley, *The History of Furniture Twenty-five Centuries of Style and Design in the Western Tradition*.

<sup>107</sup> Fiell and Fiell, *1000 Chairs*, 6.



With an understanding of IKEA, the persona will be situated within the scenarios detailed in the design briefs in Chapter 4.

To understand IKEA, one must try to grasp its multinational scope. Founded in Sweden, in 1943 by Ingvar Kamprad, IKEA is probably one of the world's most successful multinational retail firms. IKEA has 204 fully owned stores in twenty-four countries, eleven of which are in Canada. Cumulatively, IKEA stores are visited by 410 million people yearly and had worldwide sales of 20.9 billion Canadian dollars in 2005.<sup>108</sup>

The company's success is often attributed to its philosophy defined as the IKEA Concept which states that "We shall offer a wide range of well-designed, functional home furnishing products at prices so low that as many people as possible will be able to afford them."<sup>109</sup> IKEA believes that the product range is their identity, "it must express form and be colourful and cheerful, with a youthful accent that appeals to the young at heart of all ages."<sup>110</sup> In general, furniture consumers tend to be predominantly under the age of fifty.<sup>111</sup> IKEA claims that it "does not go in for throwaway products. Whatever the consumer purchases shall give long-term [sic] enjoyment."<sup>112</sup> In the scenario proposed, the three chairs will be a more clear demonstration of this claim of durability made by IKEA in its "range policy".

IKEA has a strong commitment to sustainability as is demonstrated by the extensive documentation of IKEA's environmental and social initiatives available on the IKEA website and documented in several books, such as *The Natural Step*. Anders Moberg, President of IKEA, admits that the need for sustainability is a reality and that IKEA must adapt to it. IKEA is

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<sup>108</sup> Ikea Facts and Figure, Ikea Canada Website, [http://www.ikea.com/ms/en\\_CA/about\\_ikea/facts\\_figures/figures.html](http://www.ikea.com/ms/en_CA/about_ikea/facts_figures/figures.html) (accessed January 8th, 2006).

<sup>109</sup> Bertil, *Leading By Design: The Ikea Story*, 229.

<sup>110</sup> Ibid, 230.

<sup>111</sup> Research and Markets. "Beds, Bedrooms and Upholstered Furniture Market Assessment." <http://www.researchandmarkets.com/reports/3497/3497.htm> (accessed February 23, 2006).

<sup>112</sup> Bertil, *Leading By Design: The Ikea Story*, 230.





currently working with Chalmers University in Sweden to establish a material inventory of all of their products and is working with Kingston University in the UK in the design of furnishings from an environmental perspective, including design for disassembly and dematerialization.<sup>113</sup> IKEA is also practicing take back practices in some European cities and is anticipating expanding this to more products and stores. This is partly due to impending legislation building upon existing EU legislation such as the Waste Electrical and Electronic Equipment (WEEE) directive which requires all manufacturers to bear the financial burden of reclaiming and recycling the products that they produce.<sup>114</sup> IKEA's attempts at corporate social responsibility, environmental design, supporting sustainable forestry, supply chain management and minimizing transportation and distribution demonstrate their growing involvement with sustainability issues.<sup>115</sup>

### 3.2 General Design Criteria, Methodology and Deliverables

Research suggests that furniture purchases are closely linked to the housing market and that most furniture purchases are made at the time of moving into a new home.<sup>116</sup> Through the use of a persona, the short, medium and long-term use chairs will be designed for three phases of the human lifecycle: first-time home leaver, most likely a university student; first-time home owner without a family; and, first-time parents or couples starting a family. By framing the scenarios in this way, I suggest that social shaping will occur in the shift from

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<sup>113</sup> Zurcher, *The Natural Step, Organizational Case Study*. [http://www.naturalstep.org.nz/downloads/International\\_Case\\_Study\\_pdfs/TNSI\\_Ikea\\_Denmark.pdf](http://www.naturalstep.org.nz/downloads/International_Case_Study_pdfs/TNSI_Ikea_Denmark.pdf) (accessed March 26, 2006).

<sup>114</sup> For more information see "Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE)" in the *Official Journal of the European Union*. [http://www.aeanet.org/GovernmentAffairs/gajg\\_WEEE\\_Officialtext\\_27JAN03.asp](http://www.aeanet.org/GovernmentAffairs/gajg_WEEE_Officialtext_27JAN03.asp) (accessed April 17, 2006).

<sup>115</sup> See note 110 above.

<sup>116</sup> Research and Markets. "Beds, Bedrooms and Upholstered Furniture Market Assessment." <http://www.researchandmarkets.com/reports/3497/3497.htm> (accessed February 23, 2006).



unsustainable consumption practices to more sustainable ones.<sup>117</sup> This shifting will occur through the engagement and education of the consumer in sustainability issues pertaining to product lifespans. The chairs should also demonstrate the principles of sustainable design as well as the social and psychological criteria outlined in Chapter 2, appropriate to the anticipated lifespan of the product during the use phase; that is short, medium or long-term. Each of these chairs should aim to have a market niche defined by the persona, be easily manufacturable and functional.

### General Methodology

The design process will begin with a definition of the task, a problem definition and methodology for design. The methodology for design is drawn from the research conducted in Chapter 2, which outlines the principles for sustainable design and the social and psychological reasons for attachment or detachment. Figure 1 provides a general rubric for the design of products with a pre-determined lifespan. This rubric can be applied to the design of most products, but in these case studies will be limited to the design of domestic, interior arm chairs. The grading scheme of 1, 3 and 5 provide an emphasis of importance of the criteria in the design of short, medium and long-term products. For example, user experience and pleasure is an important aspect of the design of a short-term product, rated 1, while it is essential to the design of a product intended for long-term use and attachment, rated 5.

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<sup>117</sup> The scenario concept employed in design is based here on the 2002 work of Ezio Manzini, referenced in the bibliography.



CRITERIA		SHORT 1-5 years	MEDIUM 5-20 years	LONG 20+
Sustainable Design	CRADLE TO CRADLE	Red	Red	Red
	USER EXPERIENCE AND TREASURE	Yellow	Red	Red
	DEMATERIALIZATION	Red	Red	Yellow
	DESIGN FOR DISASSEMBLY	Yellow	Yellow	Red
	ART AND CRAFT	Yellow	Yellow	Red
	PARTS AND REPAIRS	Red	Red	Yellow
Social and Psychological	EXPRESSION OF SELF	Yellow	Yellow	Red
	MEANINGFUL TOOL	Red	Yellow	Red
	LIVING OBJECT	Yellow	Yellow	Red
	NEGATIVE EMOTIONS	Red	Yellow	Yellow

Figure 1     The Principles of Sustainable Design and Social and Psychological Reasons for Attachment and Detachment Prioritized for the Design of Short, Medium and Long-Term Products.

In the following section, this rubric will be expanded upon and explained further in regard to the chair designs by addressing the following points; anticipated lifespan, target user, appropriate sustainable criteria, appropriate social and psychological criteria, human factors, aesthetics, manufacturing and marketing.

The Problem Solution and Design Development will include and not be limited to sketches, sketch models, rapid prototypes, dimensioned drawings and a finished prototype in the appropriate materials where possible.





### General Deliverables

Documentation of the design and production process.

Finished prototypes

Exhibition

### 3.3 Short-Term Use Problem Definition and Methodology for Design

As noted, the ideal situation is that all products are designed to be durable and long lasting; however, there are certain situations in which short-term products are required. The current system of consumption promotes short-term products and a disposable material culture. In order to instigate social shifting from unsustainable consumption habits, it is important to begin with the non-durable lifespans of products in the current market system. By doing so, the consumer can be educated through design to consider product lifespans and the implications of short term products versus long term products. Therefore, the task is to design a domestic interior chair with an anticipated lifespan of less than five years. This time frame will be identified for furnishings with the shortest anticipated lifespan. As mentioned earlier, Savas found that detachment products were only used one or two times and retained on average for 4.4 years, which is the rationale for limiting the short-term product to less than five years of use.

The target users for short-term products are the youngest furniture consumers whose average age will be defined as eighteen to twenty-two years. These users typically work less than full time and live in mostly urban areas in apartments due to their medium to low income. They are the most fashion-conscious, especially in terms of clothing, and this ethic spreads



into their desire for funky, unique and personalized home furnishings. The persona developed is that of Jane, a university student who has recently left the family home for the first time and lives in an apartment with a roommate. She tends to be an urban nomad, moving to a different apartment each year and often moving to another location during the summer months to work. Jane needs a chair that can be light-weight and multi-functional, a place to relax and study. Jane's current unsustainable habits mean that she purchases cheap, fashionable furnishings and then discards them at the end of the academic year in order to save money on storage. Jane's habits could be changed if she had furnishings that were easily recyclable at the end of the academic year, which could be stored in a more convenient way with friends or family, or returned to the store for a credit against new purchases.

In order to design a short-term chair for Jane the principles of sustainable design can be employed with emphasis dictated by the rubric in Figure 1. The following paragraphs will explain the criteria set out in Figure 1 as applied to the design of a chair intended for a lifespan of less than five years.

All products designed to be more sustainable should adhere to the cradle-to-cradle philosophy. Adhering to this philosophy will be an implicit expression of values as sustainable design offers an opportunity for designers and consumers of products opportunities to express their social and political beliefs. A sustainably designed chair inherently demonstrates or comments on the design of consumer products which are not sustainable. Therefore all sustainable products should involve an element of social commentary in order to challenge the status quo. However, short-term products should have a more overt and easily understandable message due to the limited interaction time. This could be achieved through promotion of the chair as sustainable, aiding in the education of the consumer through designed products. The idea of product lifetime labeling has been raised by some researchers as a way to engage



consumers and is one possible way that promotion could support this project. Promotion is an important partner in this study as an aid to the social shifting process; however, it is not the focus of this thesis and therefore can not be addressed at length.

As defined in Chapter 2, the interaction of products with pleasurable experiences can be divided into operative and reflective parameters. In the short-term use of a product, the operative parameters are more important in defining a pleasurable experience. This is because users reflect less on a product that is used for a shorter period of time. The experience of a sustainable product should be positive and pleasurable; otherwise a shift from unsustainable product use will not occur. However, for a short-term product such as the chair, the experience does not need to be at a deep emotional level as 'product attachment' is not anticipated.

Social capital can be built by the sharing of furnishings, which often occurs in communal living situations of students and younger people. However, these kinds of scenarios would be more successful with more durable furnishings and the use of second-hand markets. Second hand markets and the renting of furnishings are better facilitated by more durable furnishings.

Customization of the short-term chair is an aesthetic opportunity that would be embraced by this target user, as this age group is engaged in defining themselves as individuals and making associations with social groups. However, as the interaction by consumers with short-term products is fleeting, it is unlikely that consumer customization beyond the aesthetic will occur.

Ideally, the chair will be composed of a single material to facilitate recycling which is a priority in a product with a short lifespan. Design for disassembly (DFD) will not be a driving factor in a single material design. However, if several component parts or materials are used, the products should be DFD in order to comply with the principles of cradle-to-cradle, which are very important for any short-term and especially disposable products. Even though many





products DFD or adjustments are never disassembled or changed once assembled, DFD will facilitate recycling.

The product should be producible locally as the energy used in transportation of a product with a short use lifespan makes the product energy intensive due to transportation energy inputs. However, the production does not need to be limited in the way that more durable items should be. Moreover many short-term lifespan products require a low cost for consumers and therefore mass production can be of benefit in the production of short-term products.

Art and craft methods and aesthetics are a low level priority for short-term products as the often laborious hand made process of production is inappropriate for a short-term use product. However, home assembly, disassembly and construction are an option that can be utilized. This kind of construction may facilitate recycling which is of great importance. Furthermore, the recycling process should not require an energy intensive process, as is the case with plastic which involves identifying the type of plastic, grinding it into pellets, melting those pellets and reforming the plastic material.

Short-term products do not require the user to develop a lasting relationship with them and therefore the design does not require user participation or interaction beyond that of aesthetic customization, use and disposal/ recycling.

However, users do participate with the products they use in social and psychological ways as outlined earlier. In general, short-term products are intended for mass usage; therefore, their ability to act as an expression of the self is negligible, but nonetheless is a factor to consider as product choices always act as an expression of the self. Moreover, after aesthetic customization, the product can function as self expression, which is important to the persona established for the design of the short-term chair. Eighteen to twenty-two year olds



have changing definitions of themselves as they become more independent and are moving from adolescence into adulthood. While the expression of the self as individual may be negligible due to constant changes, the use of a sustainable product not only acts as an expression of sustainable values to others, but also links those users to others within the group, for example those who also hold sustainable or ecological values. If the short-term chair becomes fashionable the chair will act as a linkage to other followers of the same group-based identity.

The short-term chair will specifically act as inexpensive and functional furniture. Therefore the importance of the product as a meaningful tool is high. The meaningful association with a short-term piece of furniture will be that of social construction, but as the relationship with the product is limited, the meaningful association with it will be limited and will not allow it to become a living object.

Any new product, especially one that is of a sustainable nature, should stimulate positive emotions, to encourage use. However, those emotions do not need to be of a deep nature as in products that encourage attachment. Some negative emotions, for example dislike, boredom, bad image, attractiveness etc, are not of great consequence to a product that is intended to have a short lifespan and is designed to be disposed of. However, the product should not stimulate so many negative emotions that it discourages purchase and use.

An uncomfortable or ill-proportioned chair will discourage purchase and use. Therefore, ergonomic requirements for chairs are essential; the chair should be comfortable and encourage use. While the ergonomic function of a chair is very important, the aesthetics are a medium level requirement, as the target user is young and more fashion conscious, the products should appeal to fashionable sensibilities but not be of pure form and classic styles that can endure long-term. Due to changes in fashion and desires in the younger target user,



low cost, high technology manufacturing processes are important for short-term products in order to maintain a low retail price point. Therefore the short-term chair will be marketed as cheap and fun furniture to appeal to the target user.

### 3.4 Medium-term Use Problem Definition and Methodology for Design

As noted in Chapter 2, Schifferstein et al. concluded that 'product attachment' grows over time, especially after twenty years of ownership.<sup>118</sup> Therefore the lifespan of a medium-term product has been determined here as between five and twenty years. The target user and persona devised are young adults aged twenty-three to thirty years of age, not yet with children. They live in their own apartments, condominiums or small homes. The persona is still Jane, she is now a recent graduate, working full time with an average income. Jane needs a more durable chair, predominantly for relaxing, that is not too large to function in the small living room of the condominium she is has just purchased with her boyfriend. Jane is busy; she works long hours and has many different social activities. Jane desires stylish but low maintenance furnishings suitable to co-ordinate with her existing furnishings. However, as she has just purchased her first home, she does not have a great deal of disposable income for purchasing furniture. Jane has now become more engaged with the lifespan of furnishings, due to her engagement and choice of a specifically short lifespan product previously. This reflection on the lifespan and durability of products has educated her as a consumer and encouraged her to be more concerned with the environmental and social impact of the purchases she makes.

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118 Hendrick. N.J Schifferstein. et al. "Designing Consumer-product attachment", 328.





Because Jane has purchased the short-term chair which was marketed as cradle-to cradle, she would be concerned that subsequent purchases offer the same benefits. Therefore, the medium-term chair must also comply with the Cradle to Cradle philosophy. The medium-term product should have a less overt social commentary, one that is revealed more slowly due to the longer relationship with the product. The promotion of its sustainable values is important as an educating tool; however, can be more covert as the chair's sustainable attributes will be discovered over time.

In the medium-term use of a product, both the operative and reflective parameters are important in defining a pleasurable experience. As many reflective parameters as possible from the experience realms outlined in Chapter 2 should be engaged in medium-term use products. The experience of the chair again should be positive and pleasurable to necessitate a shift to sustainable product purchases and use.

As mentioned in Chapter 2, social capital can be built by renting centers and/or second hand retail stores or at the IKEA outlet. Medium-term use furnishings would be more appropriate for this kind of situation, as they can be physically durable like long-term use products, but do not require the kinds of emotional attachment that non-shared products require for durability. Medium-term products are often fashion oriented in nature and fuel the second-hand or thrift store economy. These situations promote consumer customization, i.e. mix and match.

If the medium-term chair is composed of several component parts or materials, the chair should be designed for disassembly (DFD) in order to comply with the principles of cradle-to-cradle. DFD can be facilitated if the product is producible and recyclable locally. However, the production does not need to be limited in the way that more durable items should be. The chair should not be produced on a mass level as with short-term products because of its more



fashion oriented aesthetic may lead to over production and premature obsolescence prior to the end of the designated use phase. A lower production run can add value and prestige to products through adding a sense of uniqueness. This approach has been embraced by some high street fashion clothing and footwear manufacturers where fashions are produced in limited runs and special editions and can be applied to medium-term furnishings.

Art and craft is an important element in the design of medium-term products from an aesthetic point of view to add value. However, the material choices and a hand made process of production are inappropriate for a medium-term use chair because it will not fit into the price category of unique crafted products.

Medium-term products require the user to develop a relationship with them. Therefore, the design requires a level of user participation or interaction appropriate for the medium-term use phase in order to create a level of attachment to the product to encourage its use for up to twenty years.

The social and psychological criteria must be considered to encourage this mid-term level of attachment. Therefore, the medium-term chair's ability to act as an expression of the self is important. As mentioned in the short-term chair design criteria, all consumer products act as expressions of the self. In the medium-term scenario, the persona used is more home décor conscious and therefore, the self expression provided by this chair is activated by style choices made. While the expression of the individual is important, the use of the product must also convey social ties to the group. In the medium-term chair, this social connection will be with the partner who also shares the home and guests or visitors to the home.

Medium-term use furnishings should encourage attachment and therefore, the need for the product to act as a meaningful tool is important. The chair should be ergonomically comfortable and function well, satisfying the needs of the persona. The meaningful



associations with a medium-term product will be numerous and should potentially propel the product into long-term use. A medium-term product that lasts a long time, for example twenty years, could potentially allow the product to become a living object, defined in Chapter 2.2 as a product that has existed long enough to take on its own persona as a member of the family. However, this idea is more likely to occur in a product that is designed to last longer than twenty years.

In order to encourage use, any new product, especially one that is of a sustainable nature should stimulate positive emotions such as confidence, care, or relaxation. Deep emotions will encourage attachment and propel the product into the long-term use, which is an ideal situation. As with positive emotions, negative emotions, such as uselessness or boredom, could encourage premature disposal, reducing the product to short-term use, which is not the ideal situation, therefore negative emotions must be kept to a minimum.

In order to discourage negative emotions, the ergonomic requirements for the medium-term chair are a high priority; the chair should be comfortable to encourage use. Aesthetics are a medium level requirement, as the target user is young and more style conscious. Therefore the products should be stylish but not overly fashionable as to become psychologically out-of-date before the twenty year lifespan is reached.

The chair will be marketed as mid priced stylish furniture to appeal to the target user persona. A mid-level price point is appropriate for medium-term products. This medium price level will allow IKEA the use of more expensive machinery and technology and possibly several processes in manufacturing, all of which will be potentially necessary to satisfy the ergonomic and aesthetic requirements. Fashionable styles in furnishings are often linked to developments in production technology, an example is the invention of plastics technology





and the ensuing popular forms created in plastic that were not possible in previous materials and processes.

### 3.5 Long-term Use Problem Definition and Methodology for Design

Schifferstein et al. concluded that 'product attachment' grows over time, especially after 20 years of ownership.<sup>119</sup> Therefore the design of an attachment product should consider its anticipated lifespan to be longer than 20 years, even multi-generational. The target users for long-term products are young families or couples aged thirty and older and starting a family. A UK study suggests that the age range of thirty to thirty-nine is the largest group of potential furniture buyers<sup>120</sup>. The persona is still Jane who is now married to Dominic. The couple is ready to start a family, double income with both working full time. Jane and Dominic need a chair predominantly for relaxing. It can be larger than the medium-term chair, as they have just purchased a single family home. Jane is pregnant; therefore, the furnishings they desire are child friendly and durable. They are aware that they are unlikely to make furniture purchases again until after the children are grown up. The couple is prepared to spend more money on the furnishings than they ever have in the past. They desire stylish furnishings that can act as a status symbol within the home. The functional requirements of the chair are important. It should be suitable to co-ordinate with existing furnishings but also offer a relatively timeless aesthetic and a purity of form and material choice that can endure the long lifespan of the chair.

Long-term products should adhere to the Cradle to Cradle philosophy, but have a more covert message or social commentary that will release its meanings or story over a period of

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<sup>119</sup> Hendrick. N.J Schifferstein. et al. 2002. "Designing Consumer-product attachment", 328.

<sup>120</sup> Research and Markets. "Beds, Bedrooms and Upholstered Furniture Market Assessment." <http://www.researchandmarkets.com/reports/3497/3497.htm> (accessed February 23, 2006).



time. This will maintain the user's interest and give the product multiple personal and social meanings, like a piece of art. Moreover, the experience of any product should be positive and pleasurable, to encourage purchase and use. This is especially important for a product that aims to encourage attachment. The operative experience needs to be highly positive, encouraging as many reflective parameters as possible from the experience realms outlined in Chapter 2, building an enduring and ever changing story.

As mentioned, social capital can be built by the renting and sharing of products. However, the nature of social capital requires that products are shared and community based. Therefore it can be included in the criteria of long-term products, but would not be of high level importance due to the lack of attachment which is the goal of a long-term product. Meanwhile, the dematerialization of the long-term furnishings in the form of renting and sharing is less of a priority because durable products can be considered to already be low impact because they use less material than several less durable products that do not last as long.

Customization of long-term products is a priority as customized products allow for many reflective parameters and deep personal experiences that encourage attachment. Customization does not have to be physical, but can be at a psychological level through a personalized narrative.

While products designed for disassembly (DFD) are desirable, in order to comply with the principles of cradle to cradle, this aspect can be more difficult for long-term use products. Long-term products are usually designed more robustly and thereby, require more permanent assembly techniques. As DFD is a technique employed to encourage recycling, DFD should be optimized, but is not a high priority here because long-term use products are not intended to be disposed of. A product designed for long-term usage is not intended for disposal. Therefore, it is less important that the product is easily recyclable; however, it is ideal that all



products are recyclable or biodegradable with benign environmental effects during use, i.e. do not off-gas toxic odors.

In terms of energy use, products intended for a long lifespan can be produced further away from the point of sale. However, in order to satisfy other important criteria, such as customization and art and craft aesthetics, the product would more likely be produced locally and with limited production to increase rarity and higher perceived value. Art and craft production methods and aesthetics add perceived and economic value to products as discussed in Chapter 2 and therefore are of great importance in products designed for long-term use. Moreover the art and craft artifact produced locally can imply a more locally significant aesthetic and meaning.

Finally, as long-term products require the user to develop a lasting relationship with them their design requires involved user participation or interaction over a long period of time. In this way the user can create a narrative and build stories around the product.

To build stories a long-term product should primarily act as an expression of the self in order to maintain its relevance to the user. It should be unique enough to the user that it expresses them as an individual. While the expression of the self as individual is important, so are the social links to others. The chair should be the kind that encourages ties with other members of the family or friends creating, reinforcing and acting as indicators of those social linkages.

The importance of the long-term products as meaningful tools is not especially high, because, as the research documented in Chapter 2 demonstrates, attachment to products is maintained even after the product has lost its function. However, the products should perform their tasks well in the beginning of product ownership (up to twenty years) otherwise premature disposal will occur. Research, in Chapter 2, shows that attachment products possess many





reasons other than those related to function that encourage attachment that takes place; however, in the case study of chairs the importance of acting as a meaningful tool and maintaining its function is high.

The meaningful associations built and nurtured over time with a long-term product are of high importance as these associations encourage and maintain attachment. Unlike the short and medium-term chairs, the time spent interacting with the long-term chair will allow it to become a living object. That means that furnishings that are special, over time, may eventually become a 'member of the family'.

Positive emotions, such as nostalgia, are extremely important to long-term products in order to encourage attachment. These emotions must grow over time in order to build meaning and psychological ties with the chair. Meanwhile, negative emotions can have adverse affects on a product that is intended for long-term use. There should not be any negative emotions stimulated by the product in order to discourage premature disposal.

To encourage positive emotions, the chair must be ergonomically designed to be extremely comfortable. Due to the age of the target user and propelling the use of the product more than twenty years into the future, aging population issues must be addressed. In particular the possible onset of rheumatoid arthritis in one or both of the users should be addressed. More common in women, arthritis tends to peak in the fourth and fifth decades of life with a general onset between 25 to 50 years of age.<sup>121</sup> Weight gain must also be a design consideration and therefore the chair should be sturdy and encourage good posture.

As with ergonomics, aesthetics are of major importance and must not be locked into a fashionable trend, but instead inspired by a timeless form and style. As the chair is intended to become a family heirloom or antique, it must also be representative of its culture of production

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<sup>121</sup> E-Medicine Website. <http://www.emedicine.com/emerg/topic48.htm>



in order to situate it within an era, while being classic enough in form to transcend future style changes, fads and fashions.

The manufacturing and material choices must adhere to the durable product criteria by being robust enough to avoid premature breakage. The material choices and production techniques employed must also satisfy the aesthetic criteria, probably making references to craft production with materials that carry inherent value.

The long-term chair will be marketed in a higher priced product category, due to its more expensive materials and construction costs. The higher price will also add psychological value to the product by demanding more financial and emotional investment by the user. This will help ensure that the decision to purchase the chair is not made on impulse, leading to regret and premature disposal.

## **Chapter 4    Design Development and Results**

### **4.1    Short-term Use Chair Case Study**

The design process of the short-term chair is visually documented by images of several versions of digital models as well as full scale sketch models in Appendix I i. Figure 2 illustrates that the final version of the short-term chair is simple, geometric in form, and is made from cardboard. The chair satisfies the appropriate criteria drawn from the principles of sustainable design. The material used in the chair is cardboard, which can be recycled in a closed loop at the point of manufacture or the point of sale.





Figure 2 “Boite” The Short-term Chair Design

Most young people in Canada have grown up with recycling and blue/ green box programs in their neighborhoods and are therefore familiar with the recyclability of cardboard. Therefore, recycling the chair at the end of its life will not be a foreign concept. Meanwhile, the structure being made of cardboard is a direct comment on the ecology of materials used in furniture production. It is obviously a short-term product and less durable than other types of furniture which commands the consumer to consider how long they intend to use the product. The chair's operative parameters are strong and its functional qualities override the reflective parameters of the chair. The chair's simple aesthetics, of a modern geometric form, and with limited ornamentation, support operative parameters over reflective. Moreover these aesthetic choices made in the design represent the majority of consumers currently shopping at IKEA, demonstrated by the aesthetics of the products that are already in the IKEA collection. The user experience of this chair would be pleasurable due to its functional attributes as a





comfortable chair. However the chair does not provide for deep emotional reflection, which is not necessary in a short-term chair.

The local manufacture of the chair using regionally sourced materials can provide social and economic capital to the community in the form of employment in second tier industries. As the chair is specifically designed for short-term use, it will likely not move into rental or second hand markets and therefore will not provide social capital in that sense. However, the chair could be used for municipal events where short-term chairs are needed. This may potentially propel the chair into medium term use if the chairs are kept by the municipality for more than five years.

The cardboard chair's design is flexible enough that it can be customized at the outset for the particular duration of the chair. For example a cardboard only structure (without slip covers) can be produced for very short-term requirements (i.e. less than one month). For longer durations (i.e. less than one year) the chair can be printed with patterns, colours or decorated by the user. For longer durations, the chair can be upholstered with a slip cover available at IKEA to aesthetically integrate with the user's personal preference, customized further with the use of throw cushions.

The design of the chair allows it to be either composed of one single material, cardboard, which is already a recycled material, or a maximum of three materials (cardboard, fabric, and, polyester or cotton batting for cushions), all of which are recyclable. There are very few areas glued which does not impede recycling. The chair does not have any hardware and therefore the chair is designed for disassembly, encouraging local recycling and reclamation of materials.



The cardboard can be cut out on site, employing the principle of 'point of sale production' proposed by Ezio Manzini.<sup>122</sup> This concept reduces the need for transportation and encourages limited production and less waste. The scenario proposed is that one can order the chair on the showroom floor. The chair is cut out in the store and is then collected at the cashier or 'pick up point' on the way out. This way, only the number of chairs purchased need to be produced, making the chair low in energy consumption and produced locally.

The chair's pattern can be cut out from a sheet of cardboard either by the user at home or at the retail outlet. It can then be assembled and decorated at home by the end user. This relates the chair to 'do it yourself' projects and craft production.

The chair is highly recyclable and can be made from readily available materials as cardboard is a widely available material that is usually composed of recycled material. There is the possibility of recycling cardboard previously used for other applications. One opportunity lies in the cardboard used for shipping other products on pallets, which then can be used for the production of the chair.

The user can participate directly by making the chair themselves, using an x-acto knife, a pattern, and, directions provided by IKEA. The choice of chair details, with or without upholstery, encourages the user to consider the lifespan of the product during the use phase, encouraging them to consider their needs more closely. In general, the participation evoked is limited in the short-term chair because of the limited lifespan of the product.

The short-term chair addresses the sustainable design criteria as well as appropriate social and psychological criteria as discussed in the following paragraphs. The design of the chair is flexible, ideally to appeal to many users of short-term products. Therefore, the expression of self is through the personalization of the product, either personally or by making

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<sup>122</sup> See Manzini "Sustainable Solutions In a Network Society: Social innovation, creative communities and advanced industrialisation".



additional purchases at IKEA. By choosing a product that is designed specifically for short-term use over a disposable product designed with more durable and non-recyclable materials, the user can express their sustainable or ecological values to others if they are already 'green'. If the consumer is not already 'green' they can begin to be educated about the impact of consumption choices they make. The chair will act as a cheap and functional piece of furniture serving its purpose effectively. Acting as a temporary meaningful tool, the associations made with the chair will be those of social construction and simple functionality and will therefore, not be on a deep and meaningful level. The chair is designed for short-term use and therefore will not likely be in the user's possession for long enough to become a living object.

The aesthetic of the chair is simple enough to be attractive to a wide audience, but in particular the target user's persona. The chair will stimulate positive emotions, but these emotions will not be of a deep and enduring nature. Meanwhile, the chair functions well and looks interesting to avoid stimulating too many negative emotions prior to recycling.

Ergonomic factors have been considered in the design of the chair and will facilitate the 50<sup>th</sup> percentile of the population to be seated comfortably, this means that the chair is a 'one size fits all' chair. The production of the product at the point of sale however, could accommodate a selection of sizes to fit many different body types, from children to larger adults. This could occur through the scaling of the digital files from which the chair is cut.

The scaling of the chair is facilitated by the aesthetics of the chair. The modern form employs a simple geometry with minimal ornamentation. This is the current trend in youthful furnishings that will appeal to the younger more fashion conscious target user. The style is simple and has clean lines to appeal to as many people as possible, conforming to the IKEA target market. The simplicity of form and colour create a non-gender specific chair that can be customized by the user.





The cardboard can be cut by a CNC (Computer Numerically Controlled machine) cardboard cutter that would be situated at the point of sale or with an x-acto knife by the consumer. Each manufacturing technique involves a single process that would enable the product to have a low price-point of approximately ten dollars Canadian. This is also supported by the concept of self assembly, in keeping with much of IKEA's current product line. The optional cushion and upholstery slip cover can be produced locally, from locally available and preferred materials (for example hemp in Canada) which will increase the price of the product somewhat, but will still maintain a low end price bracket for the chair.

The chair would be marketed as a short-term furniture solution, aimed at the specific target market, while obviously not restricted only to this market. The marketing would encourage a take back initiative that would support the chair and minimize its environmental impact.

#### 4.2 Medium-term Use Chair Case Study

The design process of the medium-term chair is visually documented by images of several digital models in Appendix I ii. Figure 3 illustrates that the final version of the medium-term chair is a multi-functional chair and guest bed, a new take on the very practical, but often uncomfortable futon. As with the short-term chair, the medium-term chair also complies with the Cradle to Cradle philosophy and the principles of sustainable design. The medium-term product should have a less overt sustainable social commentary, as it is not immediately evident that the chair is eco-friendly because the chair uses the most environmentally sensitive conventional materials available.



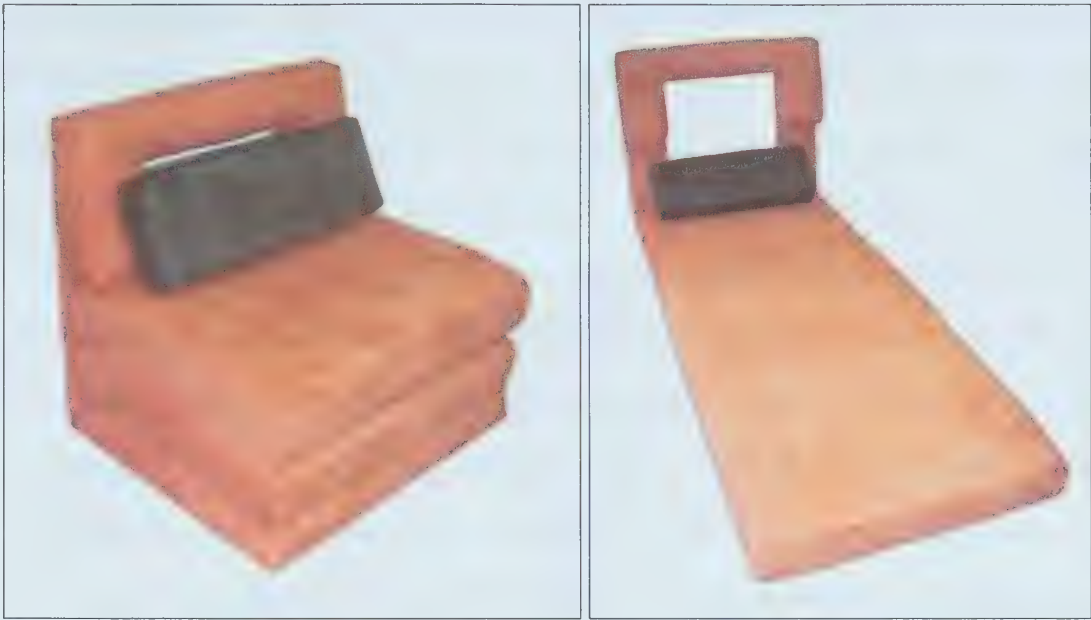


Figure 3. "Dorme" The Medium-term Chair Design

In the medium-term use of a product, it is both the operative and reflective parameters that are important in defining a pleasurable experience. The operative parameters of the chair are strong in that it is multi functional and may be used as both a chair and a bed. Many reflective parameters will be engaged in the use of the chair as a guest bed facilitating social interactions through the stories and experiences that occur while having house guests. Therefore the experience of the chair will be positive and pleasurable to command a shift from unsustainable product use.

As mentioned in Chapter 2, social capital can be built by the use of renting centers and/or second hand retail outlets. It has been established in the design brief that medium-term use furnishings would be more appropriate for this kind of situation. The medium-term chair is made from durable materials that will allow the product to last in several people's possession consecutively. The chair is more fashionable than the short-term chair and the long-term chair,



through being modern in form but more ornamental than the short-term chair. The upholstery chosen is faux suede which is a popular and durable choice in upholstery. It is made from one hundred percent polyester which is fully recyclable and cleanable. The colours of the fabric are orange and brown which are popular this season and fit with IKEA's 2006 collection. The chair's aesthetic is strongly linked to its function. The hole in the back of the chair allows the back to be used as a handle for easy re-location of the chair, when using it as a bed. The hole also allows the chair to integrate into any interior by bringing the surrounding environment, colour scheme or patterns into the composition of the chair. These aesthetic elements allow the chair to withstand minor style changes and allow for a mix and match of different furniture.

The chair is composed of several materials: strawboard, which is a particle board substitute which uses straw which would normally be burned and does not contain formaldehyde; polyurethane foam, which can be recycled but is not ecologically benign and unfortunately does not have a viable alternative at this time; and 100% polyester upholstery fabric, which is easily recyclable and is one of the most sustainable fibers available for upholstery. The chair is designed for disassembly in order to facilitate repairs and recycling at the end of its useful life.

The chair is made of strawboard, which is a locally available material. The foam and the polyester upholstery are also locally available materials which cut down on transportation energy, financial and environmental costs.

The medium-term chair satisfies the sustainable design criteria as well as the social and psychological criteria. The medium-term chair's ability to act as an expression of the self is important. The persona used is more home décor conscious and therefore the expression of the self is demonstrated by the purchase of a stylish chair reflective of current trends in





furnishings. The use of the chair will communicate these personal tastes expressed by home furnishings, while the use of it as a bed for visitors will solidify social ties to the group.

As medium-term use furnishings should encourage a level of attachment, the chair has been designed as multi-functional and will therefore act as a meaningful tool by facilitating entertaining. The chair is comfortable and functions well in each configuration, a chair or a bed and therefore will satisfy the needs of the persona, Jane. The meaningful associations made through use of the chair as a bed or a chair will be numerous. If those emotions are of a deep nature, it is possible to encourage attachment and propel the product into the long-term, which is an ideal situation.

Any new product, especially one that is of a sustainable nature, should stimulate positive emotions, to encourage use. Negative emotions should be minimized in the design of a medium-term product in order to ensure that the anticipated lifespan of the product is reached.

The chair is ergonomically designed for the 50<sup>th</sup> percentile of adults seated and sleeping. This means that the proportions are calculated to fit the average sizes of adult males and females. The chair is a stylish and elegant form with clean contemporary lines which break up the solid geometry of the chair playing on the positive and negative space of the composition. The chair does not have arms in order to facilitate the change from chair to bed. Moreover, if two chairs are put together, a double bed can be created.

The base of the chair is constructed using a CNC machine, assembled using biscuits (a form of wood dowel) and wood glue, which do not impede the recycling or biodegrading process. The upholstery is sewn over the foam. The chair will be marketed as mid-priced, approximately two hundred dollars, fashionable furniture intended to appeal to the target user persona, Jane.



### 4.3 Long Use Term Chair Case Study

The design process of the long-term chair is visually documented by images of several digital models and two full scale sketch models, constructed using strawboard in Appendix I iii.



Figure 4. "Roche" The Long-term Chair Design

Figure 4 illustrates the final version of the long-term chair. The long-term chair is a rocking chair which is designed primarily with the intention of being a nursery chair, one for nursing,



feeding or comforting a new born baby or rocking a young child to sleep. It satisfies the appropriate criteria drawn from the principles of sustainable design as discussed below.

The chair is made using a single material, solid walnut, and hardware. As Canada's climate does not allow for many local hardwoods, much hardwood is grown in the southern, milder climates of Canada, such as British Columbia and the southern United States, one of these hardwoods has been chosen for the chair. The use of hardwood in a product that is designed to be durable is appropriate. A solid hardwood suggests value, preciousness and durability, while at the end of its life it can biodegrade, where other types of wood, such as plywood or veneered particle boards are generally not so easily biodegradable due to the use of glue or formaldehyde binders. It is unlikely that the wood could be used for other applications through recycling as the individual pieces would be too small. However, some companies specialize in the use of reclaimed woods, more successful with a solid hard wood than with particle boards or plywoods. The use of Danish oil (pure linseed oil) as a finish does allow for the wood to be refinished with lacquers and will enhance the aging process of the wood.

Walnut trees grow in the southern warmer climates of Canada, such as British Columbia and are harvested for their wood at approximately 60 years of age, after producing walnuts from 20 years of age<sup>123</sup>. A well constructed chair could last for 60 years without needing repairs and should be durable beyond this lifespan with minor repair work and maintenance. Therefore, the chair's materials could be regenerated probably more than 100% in its lifespan.

The social commentary of the nursery chair is covert because it is not immediately evident what the specific function is. The chair represents family values and by being aesthetically gender neutral it encourages feeding and comforting by both parents. The defined

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123 Virginia Polytechnic Institute and State University Web site. "Tree Crops for Marginal Farmland Black Walnut" Page 6. <http://www.ext.vt.edu/pubs/forestry/446-602/446-602.html> (Accessed February 23, 2006).





function of the nursery chair compels the user to experience the chair. For this study I will assume that generally the feeding or comforting of one's child is a pleasurable experience, thereby creating a positive operative experience. The reflective parameters of this experience will be many over the feeding period and on into the chair's life beyond childhood. In this situation the operative and reflective parameters of the user's experience with the chair will evolve over time, building a unique narrative personalized to the individual or individuals who engage with the chair.

Social capital will not be built at the community level by the design of the long-term chair. If attachment occurs, as is intended, the nursery chair will most likely stay within the family unit. However, social capital will be built within the family unit over generations. Meanwhile, the intended lifespan of the nursery chair will mean that it will last several times longer than other chairs on the market and therefore can potentially be considered as materially low impact.

While the chair cannot be physically customized beyond the addition of cushions, it can be customized from a psychological and social point of view through its unique reflective parameters involving memories and nostalgia.

The hardware and joinery of the chair are robust, using traditional joinery techniques, which do not lend themselves to disassembly. However, the use of glue and wood joinery techniques means that the back of the chair and back legs are permanently joined. The hardware used allows for easy transportation to the retail outlet and user.

The chair employs a combination of mass and craft based production techniques, which lend themselves to a more limited production. The craft production techniques employed in conjunction with an antique, craft and art furniture aesthetic through the use of hard wood suggests a higher perceived value. Meanwhile, the direct references to Mission furniture with



the use of flat ribs in the back of the chair, suggests a linkage to antique furniture and a timeless aesthetic. The Mission furniture style grew out of the Arts and Crafts movement of late nineteenth century England and the work of William Morris. It is characterized by the use of hardwood and spindles and its exposed construction details are considered part of its charm. The contemporary approach to these references demonstrated by the more modernist geometric flat planes and surfaces situate the chair in contemporary design style, making it culturally significant and representative of its culture of production.

The nature of a nursery chair invites user participation and interaction to a great degree due to the regularity of feeding or comforting a child and therefore encourages the user to develop a lasting relationship with the chair which will be demonstrated by the potential for many social and psychological meanings.

The nursery chair acts as an expression of the self as a parent or family member, reaffirming the user's role and position in his or her own lifecycle, expressing his or her individuality. The nursery chair represents and re-enforces direct ties to others in society; the other parent; the child; and, other familial social linkages. Designed to become a family heirloom, the chair would eventually act as an indicator of social linkages to members of the family over several generations. The chair is functionally successful as a nursery chair and should remain so for at least one generation. If the function fails to define the chair as a meaningful tool to future generations, evidence shows that that will not affect the attachment level and that the chair will remain within the family (i.e. if the following generation does not have children, the chair will still carry the meanings already associated with it as well as function as a rocking chair).

As the chair ages, the wood changes, revealing its age and bearing marks of its story, facilitated by the application of oil as a finish. This will increase the chair's aesthetic value as



well as its visually meaningful associations. Moreover, special chairs and personal chairs carry meanings within families and culture (e.g. a father's arm chair, the boss's big leather chair, etcetera). Even the semantics of the word 'chair' carry meanings that are powerful and symbolic, such as the chair of a department, and the idea of a throne.

The time spent with the nursery chair will allow it to become a living object. The chair will represent the excitement of pregnancy prior to the birth of the child and the comforting through childhood. For the parents, the chair will be a reminder of young parenthood, while the child, as he or she grows up, will remember or recognize the chair as a comforting piece of furniture that has always been there. These feelings and memories of the chair will invite the chair to become a member of the family.

The positive emotions generated by the use of the chair in feeding one's child will eventually turn into nostalgic emotions which will grow over time as the child ages, encouraging attachment to the chair. Ideally, there should not be any negative emotions associated with the chair. However, negative emotions may occur during the early parenting period, due to possible nursing troubles, or issues associated with the transition period into parenthood. In the worst case scenario, negative emotions may be the result of a tragedy, such as the child dying. Negative emotions may evolve and be replaced by positive emotions, or the chair may move into a second hand market, finding a place where positive emotions will result and a new attachment story will unfold. In any case, the chair will remain a functioning and desirable chair.

The chair is comfortable for sitting in for relatively long periods of time, for most people within the 50<sup>th</sup> percentile of adult anthropometric data. The chair is deliberately lower and wider to provide more stability and is supportive for feeding and comforting a child. When feeding a child, especially when breast feeding, one should have a comfortable chair with lots of pillows





that support the arm and back. With a normal chair, feet should rest on a low footstool to facilitate the raising of the knees slightly.<sup>124</sup> The chair is designed so that a shorter person will not need a foot stool in order to be comfortable for all statures.

The chair aims to achieve a timeless aesthetic by making historical reference points, demonstrated by the use of solid wood. However, the chair aims to be representative of current trends in order to be culturally significant and true to its time of production. The chosen material, walnut, itself will carry aesthetic denotations of its contemporary culture as it is currently a very popular wood. Moreover, a more contemporary interpretation of classic rocking chair styles situates the chair in its culture of production.

The chair is mass producible, but employs some craft techniques that suggest that it will be made on in relatively limited production runs. Due to the use of solid wood and hand craft techniques, both material and production techniques will mean that the chair will be marketed in a more expensive range of products, approximately two hundred and fifty dollars Canadian. IKEA's product collection does not currently contain many chairs in the high end range, however it is possible to suggest that market trends are moving towards more value based quality goods over mass produced poor quality goods. This can be seen in IKEA's recent introduction of leather furnishings which are in a price category higher than most IKEA furnishings. As IKEA's corporate social responsibility grows, partly due to consumer demand and partly due to their sustainable philosophy, IKEA could improve its services by offering a lifetime guarantee that would encourage repair and service.

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124 E-notes.com. "Lactation definition and description". <http://health.enotes.com/medicine-encyclopedia/lactation> (accessed February 24, 2006).



### Chapter 5    Conclusions and Recommendations

This thesis developed and tested a methodology for designing products for specific lifespans: short, medium, and long term. The methodology was presented as a rubric which brought together research in sustainable design and possession theory, defining design criteria for the anticipated lifespan of a product. The rubric was used in conjunction with traditional design methodology, such as scenario building around a persona, in the conception phase of product development. The methodology devised can be applied to the design of other products within the category chosen, furnishings, while its flexible and interpretive nature allows for the rubric to be applied to other product categories. The case studies demonstrated how the use of this rubric and methodology in conjunction with promotion can modify consumer behavior. A shift from uninformed, irresponsible, and unsatisfactory consumption habits to a more sustainable consumption pattern that facilitates a more meaningful material culture can be facilitated by the use of design as an educational tool.

Doing background research for the project made it evident that researchers should place more emphasis on users and what material culture means to people during the use phase. Research into the cultural specificity of attachment to and detachment from products would also be of particular relevance. This area of study is especially lacking in the design research community. Current research in design seems to echo this need for user-centered research, particularly in the use phase. This study is of special interest to user-centered researchers because of its focus on the affect of rampant consumerism, and how it effectively addresses issues relating to sustainability and the education of consumers at the product-user interface rather than at the marketing stage.



While the intention of the study was to test a methodology for encouraging consumers to desire more durable products, the inclusion of the short-term chair in the scenario and rubric proved to be an important element in the study. There is undoubtedly a need and desire for short-term products in society. The methodology tested by the case study demonstrated the challenge of designing products for short-term use, benign environmental impacts and social relevance. The scenario devised for the short-term chair could be applied to several other products and potentially encompass complete product categories, for example technological products. For this reason, the rubric proved to be equally important for short-term as well as long-term product use.

In the development of the design of the short, medium, and long-term chairs, it became evident that resources on sustainable materials and methodologies available to designers remain minimal. This issue is not new to the design community. Several limited and usually localized databases of materials are available. From these databases, it is evident that, in some material areas, there are no viable alternatives to petroleum-based products, with their harmful effects on humans and the environment. An exhaustive search for an alternative to polyurethane foam was conducted during the design of the medium-term chair. No viable alternatives were discovered. Polyurethane foam is recyclable but contains toxic elements which require precautions during production. While it is possible to design interior domestic chairs without foam, many soft furnishings require some element of cushioning support but no option is available other than polyurethane foam. This project proves how design acts as an evaluation of the level of sustainability that can be achieved in the design process. As a result of this kind of approach, designers can inform material engineers and developers of the real needs and requirements of the design and manufacturing industries. Collaborative research would be beneficial to both stakeholders.





This study could be applied further with additional research from several disciplines such as anthropology, history, and the social and psychological sciences. Research to answer questions relating to why people dispose of functional products, why people keep products, what it is about those products that make them both desirable and durable, and how people interact with their material culture over time would be useful to future projects in the area of designing for durability. An abundance of quantitative data and culturally specific ethnographic research could potentially fuel future design theory and the use of practical methodologies to shift contemporary consumer culture away from its collision course with ecological disaster.



## Appendices

I A Manifesto for Eco-pluralistic Design... designs that tread lightly on the earth as defined by Alistair Fuad-Luke "Eco Design the Sourcebook"<sup>125</sup>

1. Design to satisfy real needs rather than transient, fashionable or market driven needs.
2. Design to minimize the ecological footprint of the product/ material/service product i.e. reduce resource consumption including energy and water.
3. Design to harness solar income (sun, wind, water or sea power) rather than use non-renewable natural capital such as fossil fuels.
4. Design to enable separation of components of the product/ material/service product at the end of life in order to encourage recycling or reuse of materials and/or components.
5. Design to exclude the use of substances toxic or hazardous to human and other forms of life at all stages of the product/ material/service product's lifecycle.
6. Design to engender maximum benefits to the intended audience and design to educate the client and the user and thereby create a more equitable future.
7. Design to use locally available materials and resources wherever possible (thinking globally but acting locally).
8. Design to exclude innovation lethargy by re-examining original assumptions behind existing concepts and product/ material/service products.
9. Design to dematerialize products into services wherever feasible.
10. Design to maximize a product/ material/service product's benefits to communities
11. Design to encourage modularity in design to permit sequential purchases, as needs require and funds permit, to facilitate repair/ reuse and to improve functionality.
12. Design to foster debate and challenge the status quo surrounding existing products/ materials/ service products.
13. Publish eco-pluralistic designs in the public domain for everyone's benefit, especially those designs that commerce will not manufacture.
14. Design to create more sustainable products/ materials/ service products for a more sustainable future.

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125 Fuad-Luke, *Eco Design Sourcebook*, 15



II

Visual Documentation:

i

**Short-term Chair Design Process**

Short-term Chair Design Renderings



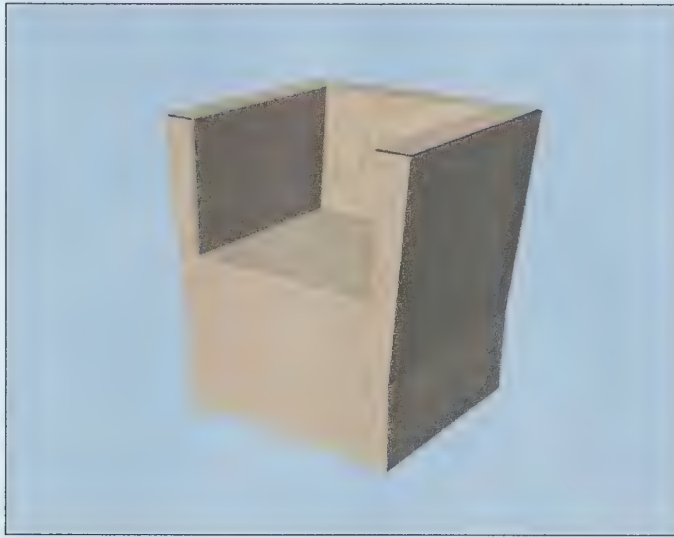
Version 1



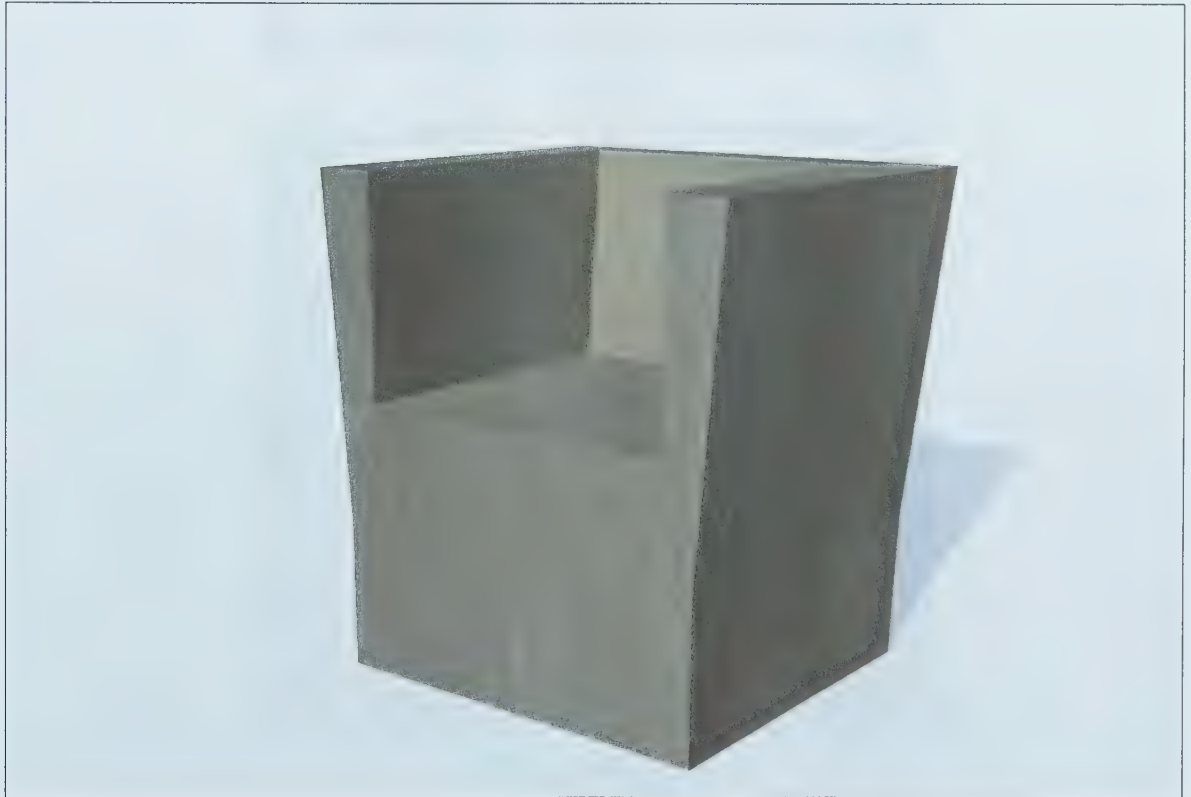
Version 2







Version 3



Final Version Rendering of the Short-term Chair





Version 1



Version 2





Version 3



Version 4 - Decoration Detail







Version 5 - Decoration Detail



Version 6





Version 7



Cutting Pattern for the Final Version of the Short-term Chair



## Medium-term Chair Design Renderings



Version 1



Version 2





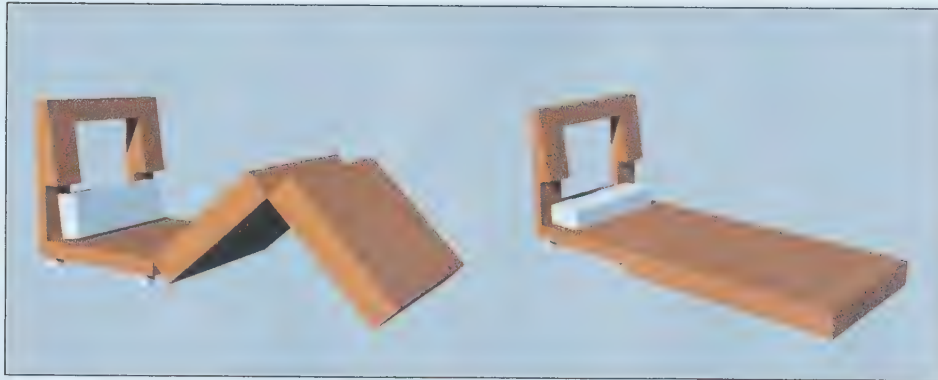


Version 3



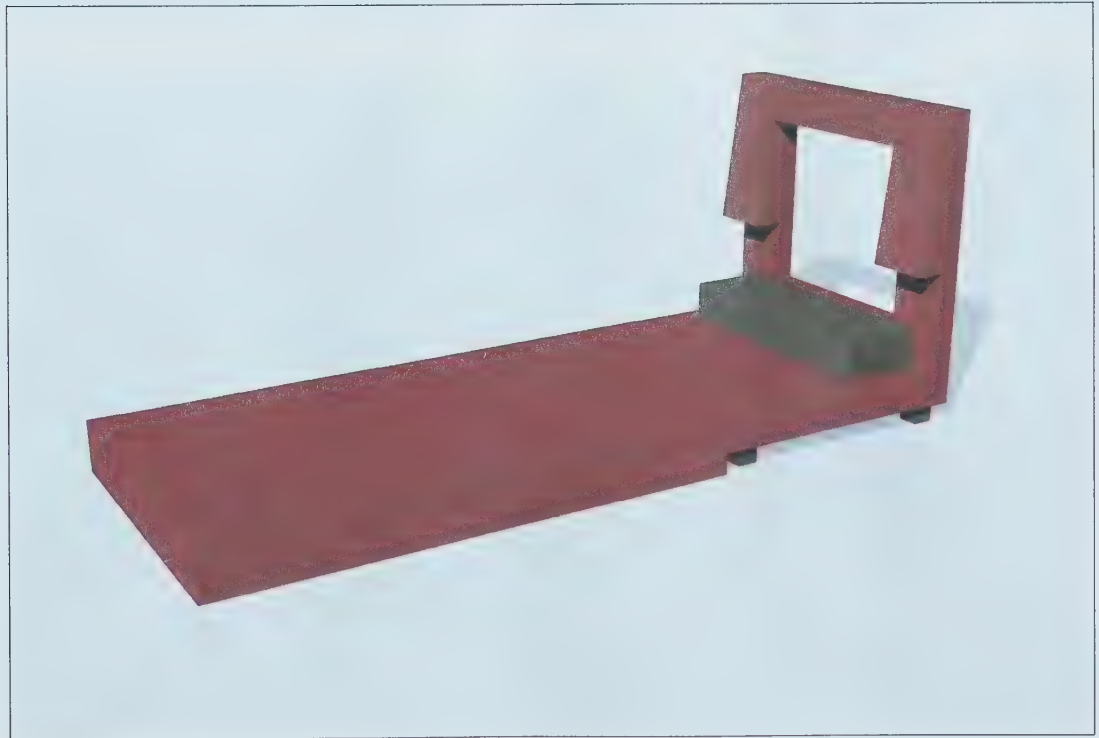
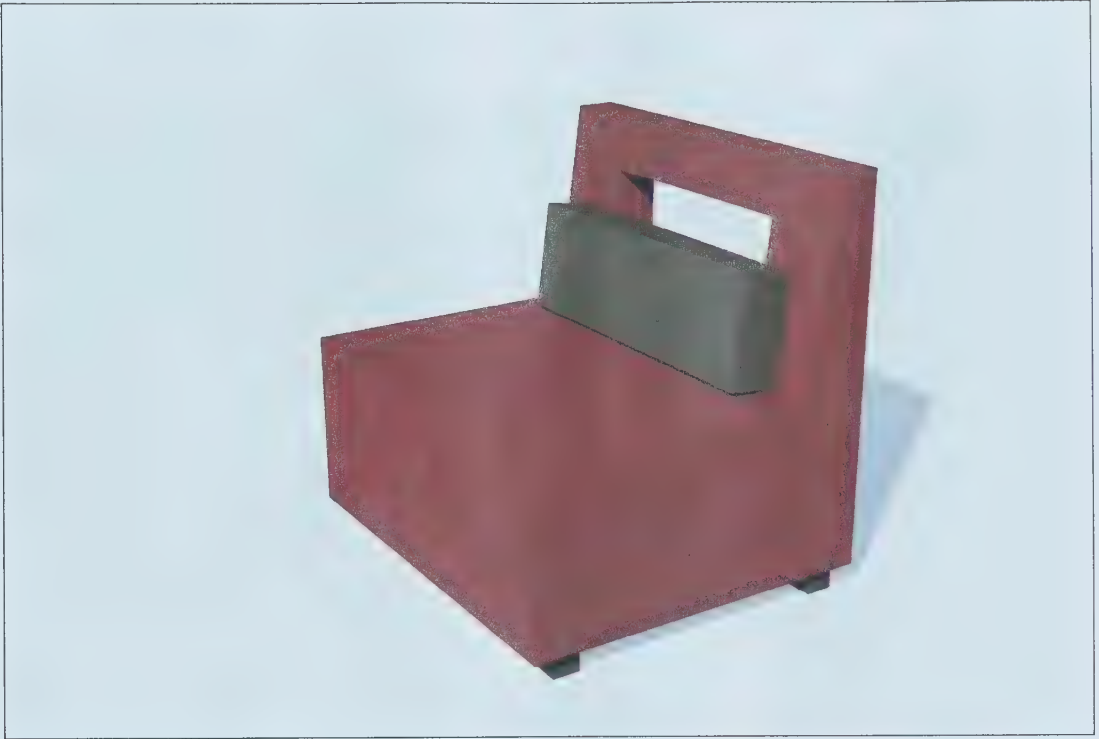
Version 4





Final Version Renderings of the Medium-term Chair





Final Version Renderings of the Medium-term Chair





iii Long-term Chair Design Process

Long-term Chair Design Renderings



Version 1



Version 2



Version 3



Version 4





Version 5



Version 6



Version 7



Version 8





Version 9



Version 10



Version 11



Version 12







Version 13



Version 14





Renderings of the Final Version of the Long-term Chair



## Long-term Chair Design Sketch Models



First Full Scale Sketch Model



Second Full Scale Sketch Model









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